# Fast Health Interoperability Resources (FHIR) v0.10

**Warning: FHIR is a draft specification that is still undergoing development prior to balloting as a full HL7 standard**

## Ballot Notes for FHIR Draft for Comment ballot

Welcome to the FHIR Draft for comment ballot + Connectathon Source. This is the "book form" of FHIR, with all the contents in a single document with contiguous section numbers, though with only a few of the extensive examples included.

Unlike the last ballot, the book form section numbers are not used for making ballot comments. They do not align with the section numbers used on the FHIR web site (which are used for the ballot). This will be rectified in a future release.

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# 1: Introduction

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## 1.0: Welcome to FHIR®

|  |  |
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|  | Fast Healthcare Interoperability Resources (FHIR™) defines a set of 'resources' to represent health and healthcare administration-related information. These resources express granular clinical and administrative concepts that can be electronically exchanged in order to quickly and effectively solve system interoperability problems in healthcare and related processes. The resources cover the basic elements of healthcare - patients, admissions, diagnostic reports, medications and problem lists - with their typical data elements and also support a range of richer and more complex clinical models. The simple direct definitions of the resources are based on thorough requirements gathering, formal analysis and extensive cross-mapping to other relevant standards. |

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FHIR Resource definitions developed by HL7 are derived from the considerable collective experience of the HL7 membership and wide community feedback from the development and application of a spectrum of health care interoperability solutions. However, Resource definitions are generalized to support multiple contexts of use. It is the responsibility of the persons or organizations using these Resources to ensure their use is fit for the particular purpose in which they are used, including validation for clinical and operational use.

### 1.0.2: Notes on Draft Standard for Trial Use (DSTU) status

FHIR is being balloted as a Draft Standard for Trial Use. A complete description of the rules for DSTU can be found in HL7's [Governance and Operations Manual (http://www.hl7.org/documentcenter/public/membership/HL7\_Governance\_and\_Operations\_Manual.pdf)](http://www.hl7.org/documentcenter/public/membership/HL7_Governance_and_Operations_Manual.pdf) . However, the essential points for implementers are covered below:

The purpose of this phase in the approval process is to gain real-world implementation experience based on a vetted, approved version of the specification prior to locking any particular aspect of the specification "in stone". This specification makes a number of statements about what HL7 will and will not do in future versions of this specification. These statements generally concern expectations around forward and backward compatibility and how the specification will evolve. However, these statements only hold once the specification is approved as a "normative" standard - the approval process that will occur subsequent to DSTU. Between different DSTU versions and between the DSTU and final approved normative version of the specification and its resources, these rules around compatibility and other issues will not be enforced. Elements may be renamed, moved, dropped or otherwise changed. Extensions may be promoted to core elements and core elements may be demoted to extensions. Wire syntax and invocation sequences may be changed. Other breaking changes may occur.

Major changes are not expected, however the risk does exist. If they occur, such changes will not be undertaken without good supporting rationale. However, long term implementability and usefulness of the specification will receive greater weight when evaluating change that impact on existing DSTU implementations. DSTU implementers should therefore provide flexibility in their architecture that will allow them to more easily accommodate changes to the specification. They should also consider how their implementations might peacefully coexist with implementations of future DSTU and normative versions that may not be fully compatible.

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### 1.0.4: Credits

FHIR is a specification produced by the HL7 Community. Many individuals contribute to the FHIR specification. Of particular note:

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* The [Govenance board (http://wiki.hl7.org/index.php?title=FHIR\_Governance\_Board)](http://wiki.hl7.org/index.php?title=FHIR_Governance_Board) is Ron Parker, Woody Beeler, Ewout Kramer, John Quinn and Grahame Grieve
* The [Managment board (http://wiki.hl7.org/index.php?title=FHIR\_Management\_Group)](http://wiki.hl7.org/index.php?title=FHIR_Management_Group) is Lorraine Constable, Jean Duteau, Hugh Glover, David Hay, John Moehrke, Brian Pech, Lloyd McKenzie, Ron Parker and John Quinn
* The following organizations have helped by attending Connectathons: [Health Intersections (http://www.healthintersections.com.au)](http://www.healthintersections.com.au/) , [Furore (http://furore.com)](http://furore.com/) , [Orion Healthcare (http://www.orionhealth.com)](http://www.orionhealth.com/) , [GE Healthcare (http://ge.com)](http://ge.com/) , [Mohawk College (http://www.mohawkcollege.ca/)](http://www.mohawkcollege.ca/) , [Thrasys (http://www.thrasys.com/)](http://www.thrasys.com/) , HealthFire, Interfaceware, Gordon Point Informatics, NProgram, and Blue Wave

### 1.0.5: Outstanding Work Items

These are recognized outstanding tasks that are yet to be completed. There are many tasks still to be done that are not listed here.

* Improve summary material for non-technical users, particularly a clinically-orientated benefits summary
* Should a resource identify which profile(s) it conforms to? (why?) (related discussion: rules of handling and version dependency)
* What consistent life cycle patterns do we need for resources?
* How to do digital signatures in json? For servers that store json/bson?
* How do we define the Zed resource (or the resource with no name)
* Minor technical issues:
  + issue with json lists and datatype choices
  + de-anonymize div element?
  + Fix problem with schematron paths capturing resources and datatypes used in extensions (by looking for valuexxx)?
  + improve path display for schematrons
  + Decide what our policy is on including formatting in Excel columns (e.g. italics in formal constraints)
  + remove profile bindings from bindings summary (i.e. EntityNamePartQualifier)
  + Many presentation improvements for presenting profiles

Additional open issues can be found throughout the text of the specification and on the [FHIR active discussions (http://wiki.hl7.org/index.php?title=Category:Active\_FHIR\_Discussion)](http://wiki.hl7.org/index.php?title=Category:Active_FHIR_Discussion) wiki page.

### 1.0.6: Version History

|  |  |
| --- | --- |
| **Version** | **Major Changes** |
| 0.07  (After 2nd Draft For Comment) | * Change to [resource references](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.references): id -> url, true relative references, remove version link * Introduce [contained resources (§1.2.6.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained) * Move primitive values into attributes instead of text. Remove [extension.ref](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility), and put extensions in the place they apply * Remove special case for data type properties: now they have @id, and the json representation is the same * Changes to [search (§2.1.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.search): rename special parameters, introduce paging, clarify date searches * Change to [updates (§2.1.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.history): /[resource]/ is now search, rename to history operation, introduce global updates operation * Clarify server obligations on [batch (§2.1.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.transaction) & add search specifier * Move Person into [Patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)/[Practitioner (§3.36)](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner) (which used to be "agent") * Rename LabReport to [DiagnosticReport (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport) & use [Observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation) for atomic data * Many new resources, including [Order (§3.31)](http://hl7.org/implement/standards/fhir/fhir-book.htm#order)/[OrderResponse (§3.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse), [Picture (§3.35)](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture), [CarePlan (§3.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan) |

## Archived Versions of FHIR

These archives only keep the more significant past versions of FHIR, and only the book form, and are provided for purposes of supporting html diff tools. A full archive history of everything is available [through the HL7 gForge archives](http://wiki.hl7.org/index.php?title=FHIR).

* [Version 0.08](http://hl7.org/implement/standards/fhir/v0.08/index.htm), Connectathon 2013 May Atlanta. ([Diff with current](http://www.w3.org/2007/10/htmldiff?doc1=http://www.hl7.org/implement/standards/FHIR/v0.08/fhir-book.htm&doc2=http://www.hl7.org/implement/standards/FHIR/fhir-book.htm))
* [Version 0.06](http://hl7.org/implement/standards/fhir/v0.06/index.htm), Second Draft for Comment. ([Diff with current](http://www.w3.org/2007/10/htmldiff?doc1=http://www.hl7.org/implement/standards/FHIR/v0.06/fhir-book.htm&doc2=http://www.hl7.org/implement/standards/FHIR/fhir-book.htm))
* [Version 0.05](http://hl7.org/implement/standards/fhir/v0.05/index.htm), Version for first Draft for Comment ballot. ([Diff with current](http://www.w3.org/2007/10/htmldiff?doc1=http://www.hl7.org/implement/standards/FHIR/v0.05/fhir-book.htm&doc2=http://www.hl7.org/implement/standards/FHIR/fhir-book.htm))
* [Version 0.01](http://hl7.org/implement/standards/fhir/v0.01/index.htm), First Archived Version (During Vancouver WGM), May 14, 2012. ([Diff with current](http://www.w3.org/2007/10/htmldiff?doc1=http://www.hl7.org/implement/standards/FHIR/v0.01/fhir-book.htm&doc2=http://www.hl7.org/implement/standards/FHIR/fhir-book.htm))

**On This Page:**

[Overview (§1.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#overview.root)

[Roadmap (§1.1.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#overview.roadmap)

[Community (§1.1.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#overview.community)

[EHR Functional Model (§1.1.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#overview.ehr-fm)

## 1.1: Overview

Fast Healthcare Interoperability Resources (FHIR) defines a set of resources for use in exchanging information about the healthcare process. Resources are:

* Atomic - they are the smallest defined unit of operation and a transaction scope of their own
* Connected - resources refer to other resources to allow for clean modular reuse of information
* Independent - the content of a resource can be processed without having to retrieve referenced resources
* Simple - each resource definition is easy to understand, and to implement without needing specialized tooling or infrastructure (though that can be used if desired)
* RESTful - resources are able to be used in a RESTful exchange context
* Flexible - resources can also be used in non-RESTful contexts, such as messaging or SOA architectures and can be moved in and out of RESTful paradigms as convenient
* Extensible - resources can be extended to allow for local requirements without impacting on interoperability
* Webcentric - where possible and appropriate, open internet standards are used for data representation
* Free for use - the FHIR specification itself is open - anyone can implement FHIR or derive related specifications without any IP restrictions

In addition to the basic resources, FHIR defines a lightweight implementation framework that supports the use of these resources in RESTful environments, classic message exchanges, human-centric clinical documents and enterprise SOA architectures. Each of these approaches provides its own benefits - FHIR provides the underpinning enablement that makes the choosing one of these painless and enables enterprises to choose their own paradigm without forsaking interoperability with other approaches.

Though the resources are simple and easy to understand, they are backed by a thorough, global requirements gathering and formal modeling process that ensures that the content of the resources is stable and reliable. The resource contents are mapped to solid underlying ontologies and models using computable languages (including RDF) so that the definitions and contents of the resources can be leveraged by computational analysis and conversion processes.

FHIR also provides an underlying conformance framework and tooling that allows different implementation contexts and enterprises to describe their context and use of resources in formal computable ways and to empower computed interoperability that leverages both the conformance and definitional frameworks.

The combination of the resources and the 3 supporting layers (implementation frameworks, definitional thoroughness, and conformance tooling), along with the completely free license of FHIR itself frees healthcare data so that it can easily flow to where it needs to be (across hospital production systems, mobile clinical systems, cloud based data stores, national health repositories, research databases, etc.) without having to pass through format and semantic inter-conversion hurdles along the way.

Compared to the all the other approaches, FHIR... [-- Obligatory: insert your ~~FHIR~~ FIRE related joke here --].

### 1.1.1: Roadmap

This specification is structured into 3 parts: the introduction, the implementation section and the resource definitions.

#### 1.1.1.1: Introduction

The introduction provides foundational material that is required to understand and use resources:

* [**Introduction**](http://hl7.org/implement/standards/fhir/fhir-book.htm#index): Overall introduction, useful links and the FHIR license
* This roadmap
* [**Resource Definitions**](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources): An explanation of the general content and identification of resources
* [**Resource Formats**](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats): An explanation of the general format and representation of resources
* [**Data Types**](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes): Common re-usable patterns encountered throughout healthcare data and used in the resources
* [**Using Codes**](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies): Explains how the use of codes (code systems, terminologies, classifications, ontologies) is managed in FHIR
* [**Extensibility**](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility): Describes the extension section of the resource and specifies the rules that apply to its use

#### 1.1.1.2: Implementation

The implementation section explains how resources are used in various contexts:

* [**Implementation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation): General requirements for using resources and various useful things including schema packs and reference implementations
* [**REST (HTTP)**](http://hl7.org/implement/standards/fhir/fhir-book.htm#http): Defines a lightweight HTTP based paradigm for using resources
* [**Messaging (§2.3)**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message): A simple request/response message based transactional framework (equivalent to HL7 v2)
* [**Documents (§2.4)**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document): Clinical documents contain attested content that are both human readable and computer processable and can be exchanged and signed as single bundles (equivalent to CDA)
* [**Security (§2.6)**](http://hl7.org/implement/standards/fhir/fhir-book.htm#security): A brief discussion of security considerations associated with using FHIR

#### 1.1.1.3: Resources

The resources section enumerates the resources:

* [**Resources**](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources): An index of the defined resources in categories
* The resources in alphabetical order

For each resource, the following pages are provided:

* **Content**: Provides context for the resource and defines its content with a simple XML format and some additional description. Formal definitions such as W3C schema and others are also provided. Also describes events and search criteria associated with the resource
* **Examples**: Provides one or more examples that show how the resource is used
* **Formal Definitions**: A table of the full formal definitions for each element in the resource along with mappings to other standards and ontologies
* **Design Notes**: Explanations of some of the less obvious aspects of the resource and explanation of why the resource is structured in a particular way. Not all resources have design notes and implementers do not need to read them
* **Profiles**: A list of profiles of the resource that are provided as part of the standard. Profiles may be provided to illustrate some aspect of the use of a resource or because certain particular uses of a resource are sufficiently common to warrant a standard profile

### 1.1.2: Community

The FHIR community meets inside the wider [HL7 community (http://hl7.org)](http://hl7.org/) and draws on its extensive human resources, institutional memory, previous standards and corporate support. HL7 itself owns FHIR and makes it freely available and the community relies on HL7 provided infrastructure.

The primary resources used by the FHIR community are the [HL7 wiki (http://wiki.hl7.org/index.php?title=FHIR)](http://wiki.hl7.org/index.php?title=FHIR) , and the [FHIR email list (http://wiki.hl7.org/index.php?title=FHIR\_email\_list\_subscription\_instructions)](http://wiki.hl7.org/index.php?title=FHIR_email_list_subscription_instructions) . In addition, the community holds regular face to face meetings as part of the [HL7 Working Group meetings (http://www.hl7.org/events/workgroupmeetings.cfm?ref=nav)](http://www.hl7.org/events/workgroupmeetings.cfm?ref=nav) . The formal governance arrangements that manage FHIR development are documented (where? - todo)

Note that each page contains a direct link to its matching wiki page where input from the wider community is managed. Community input is very welcome - please consider making comments.

### 1.1.3: HL7 EHR Functional Model

The HL7 EHR System Functional Model provides a reference list of functions that may be present in an Electronic Health Record System. While FHIR is an implementation focused on exchange of information in healthcare, this often happens in the context of an EHR. This table briefly describes one way that FHIR can be used to meet the requirements described in the EHR-FM and is provided to help readers of the FHIR specification understand how FHIR can be used. There are many other equally valid ways to implement the EHR-FM and to make use of FHIR.

|  |  |  |
| --- | --- | --- |
| **EHR Function** | | **FHIR Implementation Notes** |
| IN.1 | Security | FHIR defines parts of the security infrastructure, and delegates others to standard web based security frameworks |
| IN.1.1 | Entity Authentication | FHIR assumes that the users are authenticated. OAuth is the preferred mechanism |
| IN.1.2 | Entity Authorization | FHIR doesn't currently provide any resources to describe or manage access-control permissions. By default, underlying web frameworks such as SAML would be used. See [the security section (§2.6.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#security.binding) for a discussion of binding between FHIR and SAML |
| IN.1.3 | Entity Access Control | See above about SAML / OAuth |
| IN.1.4 | Patient Access Management | FHIR does not - yet? - include functionality related to this requirement |
| IN.1.5 | Non-Repudiation | The [provenance resource (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) tracks the timestamps, actors, digital signatures associated with resources |
| IN.1.6 | Secure Data Exchange | TLS (https:) should be used for all production exchange of data. All conformant FHIR RESTful implementations must be able to use https |
| IN.1.7 | Secure Data Routing | FHIR allows for brokers and various forms of messaging that support assured destinations and delivery (also see IN.2.2 below) |
| IN.1.8 | Information Attestation | See the [provenance resource (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) |
| IN.1.9 | Patient Privacy and Confidentiality | FHIR does not include functionality related to this requirement, though implementations would be expected to provide this |
| IN.2 | Health Record Information and Management | This is the core focus of the FHIR specification |
| IN.2.1 | Data Retention, Availability and Destruction | A FHIR RESTful server gives precise and fine-grained control of retention, availability and destruction of resources, all clearly described by the conformance statement |
| IN.2.2 | Auditable Records | FHIR provides the [SecurityEvent (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) resource for auditable records. |
| IN.2.3 | Synchronization | FHIR supports synchronization using standard web publication/subscription methods via [Bundles (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) (i.e. Atom feeds). Atom-based pub/sub may be push or pull based, and can include all resources of a particular type, or selected subsets of the resources. In addition, groups of resources can be exchanged in bundles, keeping a set of related resources in synchronization |
| IN.2.4 | Extraction of Health Record Information | FHIR does not provide report formats (yet?), but does provide extensive search and retrieval functions to assist with building such reports |
| IN.2.5 | Store and Manage Health Record Information | A FHIR RESTful server can store and manage health information persistently - see below for further information. |
| IN.2.5.1/2 | Manage Structured and Unstructured Health Record Information | The dual contents of FHIR resources - structured data and XHTML narrative - provide seamless support for dealing with a mix of structured and unstructured information |
| IN.3 | Registry and Directory Services | The FHIR [Administration resources](http://hl7.org/implement/standards/fhir/fhir-book.htm#resourcelist.administrative) provide a naturally registry based access to patients, providers, etc. |
| IN.4 | Standard Terminologies and Terminology Services | FHIR encourages the use of standard terminologies wherever possible, and provides full support for their use through a variety of terminology related [data types](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes). FHIR does not define a terminology infrastructure or service, but does define the [Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) and [ValueSet (§3.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset) resources to describe how terminology is used in a FHIR context |
| IN.5 | Standards-based Interoperability | FHIR is a definition of a standard on which to base interoperability |
| IN.5.1 | Interchange Standards | This is the core focus of FHIR. See below for discussion of interaction modes |
| IN.5.2 | Interchange Standards Versioning and Maintenance | FHIR version maintenance is [described here (§1.2.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.version) |
| IN.5.3 | Standards-based Application Integration | FHIR enables simple integration through use of an easy to understand, use and debug web based infrastructure. The same framework used within an EHR for persistence can also offer a simple way to implement exchange |
| IN.5.4 | Interchange Agreements | The FHIR Conformance Statement and Resource Profile resources provide a registry based infrastructure for individual trading partner agreements, as well as for community based ones |
| IN.6 | Business Rules Management | FHIR does not address this requirement at this time |
| IN.7 | Workflow Management | FHIR does not address this requirement at this time, though the resources and services exist to support this functionality |

The EHR functional model describes several modes for interaction between systems. Each of these can be implemented in several different ways using FHIR

|  |  |
| --- | --- |
| **Interaction Modes** | **FHIR Options** |
| Unsolicited Notifications e.g. a patient has arrived for a clinic appointment | * create/update new resource via http * push resources using atom * Send FHIR [Message (§2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message) (if appropriate event is defined) |
| Query/Response e.g., Is Adam Everyman known to the system? Yes, MRN is 12345678. | * search with parameters * A query message (though not defined yet) |
| Service Request and Response e.g., Laboratory Order for Fasting Blood Sugar and a response containing the results of the test. | Could be supported either through Messaging or SOA solutions. Request/Response support is not yet defined |
| Information Interchange between organizations (e.g. in a RHIO, or in a National Health System) | * pub/sub using atom (push or pull) * RESTful interface * FHIR messaging |
| Structured / Unstructured clinical document, e.g., dictated surgical note | See the [Documents (§2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document) |

The combination of a properly secured and managed FHIR server, along with enforced use of the [SecurityEvent (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) and [Provenance (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) resources ensures that the core record management functions defined in the EHR-FM are met:

* Lifespan/Lifecycle tracking, including capturing source, origination and authorship information, along with tracking of views and exchanges
* Attestation for accuracy and completeness, along with digital signature
* A full version history with content retention
* Retention and persistence

Additional functionality not defined (yet?) in FHIR is required to ensure non-repudiation, access control, and consent tracking.

**On This Page:**

[Resource Definitions (§1.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.root)

[Resource Content (§1.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.content)

[Bundles](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundles)

[Conformance (§1.2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.conformance)

[Resource References](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.references)

[Contained Resources (§1.2.6.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained)

[Versioning (§1.2.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.version)

## 1.2: Resource Definitions

A resource is an entity that:

* Has a known identity by which it can be addressed
* identifies itself as one of the resource types defined in this specification
* contains a set of structured data items as described by the resource definition
* contains a human readable XHTML representation of the content of the resource
* may change over time

Resources have multiple representations. A resource is valid if it meets that above rules, and is represented in either XML or JSON according to the rules defined in this specification. Other representations are allowed, but are not described by this specification.

This specification defines a series of different resource types that can be used to exchange and/or store data in order to solve a wide range of healthcare related problems, both clinical and administrative. In addition, this specification defines several different ways of exchanging the resources.

### 1.2.1: Contents of a Resource

All resources have the following aspects:

* A base set of defined data elements
* Extensions (optional) - additional data elements added by implementations (see ["Extensibility"](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility))
* A human readable narrative description of the resource (see ["Narrative"](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.Narrative))
* Contained resources - additional resources that are part of the identification and transaction space of this resource (see [below (§1.2.6.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained))
* Metadata - important information about the resource that is not part of the content model of the resource
* Tags - labels affixed to the resources that may be used to define additional operation behaviour such as security, workflow, etc.

The contents of the base resource from which all other resources derive are:

<[**[Name]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.content) xmlns="http://hl7.org/fhir">

<[**extension**](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility)><!-- **0..\*** [Extension](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility) [See Extensions](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility) --></extension>

<[**language**](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources-definitions.Resource.language) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** Human language of the content (BCP-47) -->

<[**text**](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.Narrative)><!-- **1..1** [Narrative](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.Narrative) Text summary of resource, for human interpretation --></text>

<[**contained**](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained) [Contained Resources](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained) --></contained>

<!-- Defined Data Elements for Resource -->

</[Name]>

These elements must always appear in this order. These basic elements shared by all resources come first in order to support consistent definitions for schema and UML derived code.

The optional language element specifies the base language of the resource using the [codes defined in BCP 47 (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) . Note that not all the content of the resource has to be in the language. If a language is specified, it should also be specified on the [Narrative Text](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.Narrative).

The language element is provided to support indexing and accessibility (e.g. text-to-speech use the language tag). The html language tag in the narrative applies is used when processing the narrative. The language tag on the resource is provided for use to specify the language of alternate presentations generated from the data in the resource

### 1.2.2: Resource Metadata

The metadata properties are key aspects of the resource and how it behaves. For implementation reasons, these are represented outside the resource:

|  |  |  |
| --- | --- | --- |
| **Metadata Item** | **Type** | **Usage** |
| Logical Id | [id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id) | The identity of the resource. Resources always have a known identity and it is constant for the entire lifetime of the resource. Resource identification is [discussed further below (§1.2.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Identification) |
| Version Id | [id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id) | Changed each time the content of the resource changes. Can be referenced in a resource reference ([see below](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)). Can be used to ensure that updates are based on the latest version of the resource.  The version can be globally unique, or scoped by the Logical Id. Since version ids must be unique within the scope of a single resource, they are generally either a serially incrementing id scoped by the logical id, or a uuid, though neither of these approaches is required |
| Last Modified Date | [instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant) | Changed each time the content of the resource changes. Can be used by a system or a human to judge the currency of the resource content. |

In any environment where the resources are used, the technical details of how these metadata elements are represented will need to be resolved. For further details, see [Implementation Details](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation), which also contains a discussion of how resource identity is maintained.

Resource ids are case sensitive. Ids are always opaque, and systems need not and should not attempt to determine their internal structure. However the id is represented, it must always be represented in the same way in resource references and URLs. Ids can be up to 36 characters long, and contain any combination of ASCII letters, numerals, "-" and ".".

#### 1.2.2.1: Tags

In addition to the basic contents of Resources, and their metadata, each resource can be labelled with one or more "Tags". These tags can be used to associate additional operational information with the Resources, including defining security labels used in access control policies, workflow management, and other uses. Tags are attached to resources, and exchanged with the resource. Tags are never used to keep information that needs to be understood when interpreting the content of a resource; their function is limited to finding and controlling access to the resource.

Each tag has two properties:

|  |  |
| --- | --- |
| Uri : uri | A term that defines the meaning of the tag |
| Label : string | (Optional) A human-readable label for the tag for use when displaying in end-user applications |

The Uri may be a reference to a healthcare vocabulary, including ones defined in this specification, such as the basic [security label set (§2.6.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#security.labels), or vocabularies such as those defined by HL7 (v2 and v3/CDA), Loinc, or Snomed-CT. Alternatively, the URI may be one defined by the implementation in the local context. Literal references that refer directly to a description of the tag (typically just an HTML page) are preferred over symbolic references but this is not required.

If the end user application provides functionality to the user that allows the user to affix arbitrary text tags to the resource for their own purpose, the application can automatically construct a Uri by appending the mime encoding of the Label to the base URL "http://hl7.org/fhir/tags/text/". When applications processing resources see this base URL, they can automatically know that this is a pure text label with no formal meaning.

#### 1.2.2.2: Compartments

Each resource may belong to one or more logical compartments. A compartment is a logical grouping of resources which share a common property. Compartments have two principal roles:

* Function as an access mechanism for finding a set of related resources quickly
* Provide a definitional basis for applying access control to resources quickly

Compartments define how particular instances of the compartment are defined and identified, and how systems know whether resources are in the compartment or not. Here is a list of the compartments defined by this specification:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Title** | **Description** | **Identity** | **Membership** |
| [patient (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#compartment-patient) | Patient | The set of resources associated with a particular patient | There is an instance of the patient compartment for each patient resource, and the identity of the compartment is the same as the patient. When a patient is linked to another patient, all the records associated with the linked patient are in the compartment associated with the target of the link. | The patient compartment includes any resources where the subject of the resource is the patient, and some other resources that are directly linked to resources in the patient compartment |

As an example of compartment usage, to retrieve a list of a patient's conditions, use the URL:

GET [baseurl]/patient/@[id]/condition

The details of this usage are [described under the search operation (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.compartments).

Compartments may be used explicitly, like this, but can also be used implicitly. For instance, if a FHIR server is providing a patient view of a record, the authorised user associated with use of the FHIR RESTful api may be limited to accessing records from the compartment instance(s) logically associated with their identity.

Note that resources may cross between compartments, or interlink them. Examples of this would be where a [Diagnostic Report (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport) identifies a subject, but an [Observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation) it references identifies a different subject, or where a [List (§3.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#list) resource references items that identify different subjects. Such cross-linking may arise for many valid reasons, including:

* Cases where subject records are inter-linked - Transplants, Perinatal care, family therapy etc.
* Workflow management where action lists link multiple patients and/or practitioners

Given the wide variety of use cases and contexts in which FHIR is used, compartments do not define how cross-linking is handled. Systems may reject resources, remove them from both compartments, or place them in both, or act in some other fashion.

### 1.2.3: Resource Bundles

One common operation performed with resources is to gather a collection of resources into a single instance. In FHIR this is referred to as "bundling" the resources together. The resource bundle is not just a list of references to resources, but includes their whole content. These resource bundles are useful for a variety of different reasons, including:

* Returning a set of resources that meet some criteria as part of a server operation
* Returning a set of versions of resources as part of the history operation on a server
* Storing a collection of resources
* Exchanging a set of resources as part of a message transaction
* Grouping a self-contained set of resources to act as an exchangeable and persistable group with clinical integrity (i.e. a clinical document)

Conceptually, a bundle has an identifier (url) and a date updated, and a list of resources. For each resource in the list, the bundle has the resource and also its metadata as listed above. Each entry in the bundle retains its original identifier. This means that applications reading the bundle should always look for a resource by its identity (after converting relative URLs absolute URL) in the bundle first before trying to access it by its URL.

### 1.2.4: Conformance

The contents of the resource and the formats used to represent it must conform to the rules described in this specification. Because of its general nature and wide applicability, the rules made in this specification are generally loose compared to the rules suitable for particular use cases. This specification provides a conformance layer that implementers and national/regional programs can use to provide a computable statement about how the resources and their exchange paradigms are used to solve particular use cases. This conformance layer is delivered through use of the [Conformance (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) and [Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) resources.

The specification also provides a number of technical resources that can assist with enforcing conformance to this base specification:

* Schema & Schematron
* Reference Platforms
* TODO: RDF/OWL, etc.

Note that none of these are able to check complete conformance to this specification.

The data elements defined resources and data types have 4 properties that are directly related to conformance: Cardinality, Is-Modifier, Must-Support, and Cardinality. These interact to place conformance requirements on implementations.

### 1.2.5: Cardinality

The cardinality of an element is to upper and limit of the number of elements present in the actual resource. When present, elements cannot be empty - they must have either a value attribute, child elements, or extensions. This specification only defines the following cardinalities: 0..1, 0..\*, 1..1, and 1..\*. Profiles that describe specific use cases may use other cardinalities within the limits defined by the resources.

In this specification, very few elements have a minimum cardinality of 1. Resources are used in many contexts, often quite removed from their primary use case, where information is sometimes very incomplete. For this reason, the only elements that have a minimum cardinality of 1 are those where they are necessary to basic understanding of the element that contains them. The minimum cardinalities should not be taken as a guide to which elements are expected to be present in any particular use of the resource.

#### 1.2.5.1: Is-modifier

Is-Modifier is a boolean property that is assigned when an element is defined, either as part of the base resource contents in this specification, or when profiles declare extensions. An element is labelled "Is-Modifier = true" if the value it contains may change the interpretation of other elements or the resource as a whole. Typical examples of elements that are labelled "Is-Modifier" are elements such as "status", "active", or "certainty". The value of Is-Modifier cannot be changed when element usage is described in a [Resource Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile). When an element is labelled as Is-Modifier, the documentation must be clear about why it is a modifier, and/or which elements the element may modify.

Generally, elements labelled "Is-Modifier = true" also have a minimum cardinality of 1, to introduce certainty in their handling. If the value of such an element is not explicit in the instance, or known by the context, the resource cannot be safely understood. Irrespective of the minimum cardinality, implementations producing resources SHALL ensure that appropriate values for mustUnderstand elements are provided. Is-Modifier elements SHALL be represented in the narrative summary of the resource.

Implementations processing resources SHALL understand the impact of the element when they process the resource. Implementations are not required to "support" the element in any meaningful way - they may achieve this by rejecting instances that contain values outside those they support (for instance, an application may refuse to accept observations with a reliability != "ok"). Alternatively, implementations may be able to be sure, due to their implementation environment, that such values will never occur. However applications SHOULD always check the value irrespective of this.

Servers and background processes that move resources around are not "processing the data of the resource", and these applications are not required to check for unknown extensions. Any process that copies data out of a resource for use in another context (display to a human, decision support, exchange in another format that doesn't support extensions) is processing the data.

#### 1.2.5.2: Must-Support

Labelling an element Must-Support means that implementations that produce or consume resources must provide "support" for the element in some meaningful way. Exactly what this means is impossible to describe or clarify as part of the FHIR specification.

For this reason, the specification itself never labels any elements as must-support. This is done in [Resource Profiles (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile), where the profile labels an element as mustSupport=true. When a profile does this, it must also make clear exactly what kind of "support" is required, as this can mean many things.

Note that an element that has the property IsModifier is not necessarily a "key" element (e.g. one of the important elements to make use of the resource), nor is it automatically mustSupport - however both of these things are more likely to be true for IsModifier elements than for other elements.

#### 1.2.5.3: Cardinality

All elements defined in FHIR have a cardinality as part of their definition - a minimum number of required appearances, and a maximum number allowed. This number specifies the number of times the element may appear in the instance. In the specification, the minimum number is always 0 or 1, and the maximum number is always 1 or \*, meaning no limit. Profiles may use any whole number for both minimum and maximum cardinality, as long as minimum <= maximum.

For elements that have cardinality > 1, the order in which they appear may have meaning. Unless the element definition (either in this specification or the extension) defines a meaning to the order explicitly, the meaning of the order is not defined, and implementations are allowed to reorder the elements. Note that you cannot define a meaning for the order of the elements in a profile. When there is not definition of the meaning of the order, implementations that need to choose a single element from a list of elements for some use must do so based on the semantics of the content of the elements that repeats. Profiles and Implementation guides may often make rules about this selection process.

### 1.2.6: References between resources

The defined elements in a resource includes many references to other resources. The resources combine to build a web of information about healthcare.

References are always defined in one particular direction - from one resource (source) to another (target). The corresponding reverse relationship from the target to the source exists in a logical sense, but is not represented explicitly in the resource. Navigating these reverse relationships requires some external infrastructure to track the relationship between resources.

Because resources are processed independently, relationships are not considered to be transitive. For example, if a [Condition (§3.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition) resource references a particular [Patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient) as its subject, and it links to a [Procedure (§3.37)](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure) resource as its cause, there is no automatic rule or implication that the procedure has the same patient as its subject. Instead, the subject of the procedure must be established directly in the procedure itself. Another way to state this is that the context of the subject is not "inherited" and it does not "conduct" along the relationship to procedure. The only exception to this in the case of contained resources (see below). Note that in practice, the relationships do need to describe a logical and coherent record.

In a resource, references are represented with a type, a reference, and a text description. The key property of the reference is the *reference* - resources are identified and address by their URL. The actual reference looks like this (see ["XML Format" (§1.3.1.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.syntax) for details of the way resource contents are described):

<**[name]** xmlns="http://hl7.org/fhir">

<**type** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Resource Type](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) -->

<**reference** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Relative, internal or absolute URL reference -->

<**display** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Text alternative for the resource -->

</[name]>

#### 1.2.6.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| ResourceReference.type | One of the resource types defined as part of FHIR | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/resource-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) |

Notes:

* The *type* must specify the resource type, whether or not the type of the resource reference is fixed for the element in the resource definition
* The *reference* element contains a url that is either an absolute URL, or a relative URL that is relative to the [Service Base URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.root), or an internal fragment reference (see below)
* Using absolute URLs provides a stable scalable approach suitable for a cloud/web context, while using relative/logical references provides a flexible approach suitable for use when trading across closed eco-system boundaries. (see [implementation issues for further discussion (§2.6.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.identity))
* Absolute URLs do not need to point to a [FHIR RESTful server](http://hl7.org/implement/standards/fhir/fhir-book.htm#http), though this is the preferred approach. If the tail of the url conforms to the structure "/[type]/@[id]" or "/[type]/@[id]/history/@[id]" then it should be assumed that the reference is to a [FHIR RESTful server](http://hl7.org/implement/standards/fhir/fhir-book.htm#http). Whether or not the reference is to a FHIR RESTful server, the reference must point to a Resource as defined by this specification
* URLs are always considered to be case-sensitive and lowercase is preferred
* The *display* is generally not the same content as the Resource.text of the referenced resource. The purpose is to identify what's being referenced, not to more fully describe it

**Constraints**

* Must have a local reference if the resource is provided inline (xpath: not(starts-with(f:reference/@value, '#')) or exists(ancestor::a:content/f:\*/f:contained/f:\*[local-name(.)=current()/f:type/@value and @id=substring-after(current()/f:reference/@value, '#')]|/f:\*/f:contained/f:\*[local-name(.)=current()/f:type/@value and @id=substring-after(current()/f:reference/@value, '#')]))
* Must have a type if a reference is provided (xpath: exists(f:type) or not(exists(f:reference)))

A relative reference to the [patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient) "034AB16" in an element named "context" on a FHIR RESTful server:

<context>

<type value="Patient" />

<reference value="patient/@034AB16" />

</context>

An absolute reference to a [resource profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) in an element named "profile":

<profile>

<type value="Profile" />

<reference value="http://fhir.hl7.org/svc/profile/@c8973a22-2b5b-4e76-9c66-00639c99e61b" />

</profile>

*Note that HL7 has not yet actually created a profile registry, nor decided on a URL for it*.

A short display text that provides a human readable identification of the resource may be provided:

<custodian>

<type value="Organization" />

<reference value="organization/@123" />

<display value="HL7, Inc" />

</custodian>

This text can be used by a system that is unable to resolve the reference to an actual resource.

#### 1.2.6.2: Contained Resources

In some circumstances, the content referred to in the resource reference does not have an independent existence apart from the resource that contains it - it cannot be identified independently, and nor can it have its own independent transaction scope. Typically, such circumstances arise where the resource is being assembled by a secondary user of the source data, such as a middleware engine. If the data available when the resource is constructed does not include record keys or absolute identification information, then a properly identified resource cannot be assembled, and even if an arbitrary identification was associated with it, the resource could never be the subject of a transaction outside the context of the resource that refers to it.

In these circumstances, the resource is placed directly in line in the reference. **This should never be done when the content can be identified properly, as once identification is lost, it is extremely difficult (and context dependent) to restore it again.**

An example of a contained resource:

<Document xmlns="http://hl7.org/fhir">

<extension>...</extension>

<text>...</text>

<contained>

<Organization id="org1">

<!-- whatever information is available -->

</Organization>

</contained>

<information>

<!-- other attributes -->

<custodian>

<type value="Organization" />

<reference value="#org1" />

</custodian>

<!-- other attributes -->

<information>

</Document>

The same example in JSON:

{ "Document" : {

"extension" : { ... },

"text" : { .. },

"contained: [

{"Organization" : {

"\_id" : "org1",

.. whatever information is available ...

}}

]

"information: {

... other attributes ...

"custodian" : {

"type" : { "value" : "Organization" },

"url" : { "value" : "#org1" }

}

... other attributes ...

}

}}

The type and url are always required, even though somewhat redundant in this case, to ensure that a single approach to resolving resource references can be used - simply be resolving the URL, and accessing accordingly.

Some notes about use and interpretation of contained resources:

* Contained resources share the same internal id resolution space as the parent resource
* Contained resources do not contain additional contained resources
* Resources that are contained inline also "inherit" context from their parent resource. For instance, if the parent resource contains a "subject", and the contained resource also has a subject element defined, but does not specify any subject, a processing application may infer that the subject is the same. Note, however, that such inferences are specific to a particular circumstance. There is no rule, for instance, that the meaning of the "subject" element is the same in both parent and contained resources
* Contained resources do not need to contain any narrative

### 1.2.7: Inter-version Compatibility

The following rules will apply once the specification becomes a full normative specification. These rules ensure that implementations may process the content of the resources safely while exchanging data between applications using different versions of FHIR. However during the period of trial use of the specification, HL7 may make changes outside the limitations described here in response to discovered issues in the specification. Applications may wish to use [resource tags (§1.2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.tags) to help manage this during the period of trial use.

There is no explicit version marker in the resource content. Once normative, subsequent versions of this specification may introduce new elements and/or content at any point in the resource contents, but the path and meaning of existing data elements will not be changed. Any value set or code list may be revised to include additional cods

Each binding to a value set or code system indicates whether the value list automatically grows as new codes are defined, whether the list may be extended in future versions of the specification, or whether the list cannot be changed at all in future versions.

The conformance layer ([Conformance (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) and [Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile)) have mandatory properties declaring the FHIR specification version, and these may be used to determine which version of FHIR an implementation is using.

In a typical scenario, mixed versions may need to exist, so applications SHOULD ignore elements that they do not recognize unless they are extensions with a mustUnderstand element with value="true". However, in a healthcare context, many application vendors are unwilling to consider this approach because of concerns about clinical risk or technical limitations in their software (i.e. schema based processing). Applications are not required to ignore unknown elements, but must declare whether they will do so in their conformance statements using the *acceptUnknown* element.

Additional discussion on interversioning issues can be found here: <http://wiki.hl7.org/index.php?title=FHIR_interversion_compatibility>.

**On This Page:**

[Resource Definition (§1.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.root)

[Narrative](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.Narrative)

[Internal References](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.idref)

[JSON (§1.3.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.json)

[Atom (Bundle) (§1.3.8.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.atom)

[JSON (Bundle) (§1.3.9.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.json-bundles)

[Schema (§1.3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.schema)

## 1.3: Resource Formats

This page documents how the content of the resources are described, and how they are represented in XML and JSON.

### 1.3.1: Resource Definition

The resources are described in two different ways: a UML diagram that summarises the content, and an pseudo-XML syntax that provides a visual sense of what the end resource instances will look like in XML. Note that although the description of the resources is based on their XML representation, other representations such as JSON are equally valid.

#### 1.3.1.1: XML

The XML syntax uses the following notation:

<**name** xmlns="http://hl7.org/fhir" (attrA="value")>

<**nameA**><!-- 1..1 type description of content --><nameA>

<**nameB[x]**><!-- 0..1 type1|type1 description --></nameB>

<**nameC**> <!-- **1..\*** -->

<**nameD** ><!-- 1..1 type>Relevant records --></nameD>

</nameC>

<name>

Notes:

* To build a valid XML instance of a resource, simply replace the contents of the elements and attributes with valid content as described by the cardinality, type rules and content description found in the comment in each element
* Resource and Element names are case-sensitive (though duplicates that differ only in case are never defined)
* Note that the only properties that are represented as attributes are those defined in underlying specifications such as xml:lang and [Atom (see below) (§1.3.8.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.atom), which is used as the XML representation for bundles
* Any elements that have a [primitive type (§1.4.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.primitive) will have a value attribute to contain the actual value of the element
* Elements are assigned a cardinality that specifies how many times the element may or must appear. If the cardinality is shown in Pink then there is an additional condition that impacts on the allowed cardinality. This is available as a mouse-over text, or in the formal definitions
* The elements are assigned one or more types. All of the types are defined in [the data types](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes) except for "Resource" and "Narrative" that are documented below. The type names are hyperlinked
* When a logical element can have more than one type, its name takes the form nnn[x]. The "nnn" part of the name is constant, and the [x] is replaced with the title-cased name of the type that is actually used. The types that are allowed are listed with a "|" used to separate them. When one of the types is Resource([X]), the type name in the element name is simply "Resource"
* Each element name in the pseudo-syntax is also a hyperlink to the formal definition of the element in the data dictionary that underlies the exchange formats.
* If the element name is underlined, then applications are required to [support (§1.2.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.mustSupport) and/or [understand](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.mustUnderstand) it
* The character set for a resource is always Unicode, encoded in UTF-8. Specifying the character encoding in the XML is optional but recommended.
* FHIR elements are always in the namespace <http://hl7.org/fhir>. This is usually specified as the default namespace on the root element. The only other namespaces that occur in FHIR resources are where some external content model is explicitly introduced into the resource content model. For example, XHTML is found in every resource - see below
* Any of the XML elements may have an id attribute to serve as [the target of an internal reference](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.idref). The id attribute is not shown in this format
* FHIR elements are never empty. If an element is present in the resource, it must have either a value attribute, child elements as defined for its type, an id attribute that is the [link target](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.idref) of [narrative (§1.3.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.narrative), or 1 or more [extensions](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility)
* Attributes can never be empty. Either they are absent, or they are present with at least one character of non-whitespace content
* The xml:lang attribute may appear on the root element, where it specifies the base language of the resource. It may also appear on [attachments (§1.4.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) and in the XHTML content, but nowhere else
* The formal MIME-type for FHIR resources represented in XML is application/fhir+xml
* In addition to this descriptive syntax, other definitional forms are available, including W3C schema and Schematron

When represented as XML, resources may be validated by schema and schemas are provided, but operational systems are not required to do so (though the XML must always be valid against this specification and the schema and Schematron). In addition to the simple XML description, W3C Schema, UML models, and other definitional models are provided that may be a useful aid for system implementation.

#### 1.3.1.2: UML

The UML diagrams represent the same content as a series of classes that represent XML elements. Elements are labeled with an "R" for resource, or a "D" for a data type. Classes without a label are normal classes that are just part of the content of a resource or a data type.

Where an element can have a choice of data types, these are represented in the choice using the same syntax as the xml syntax. Due to way UML works, the actual order of the elements cannot be determined from the diagram, nor is it visible whether a property is an element or an attribute.

These UML diagrams are intended to communicate the contents of the resource to a human. An alternate set of diagrams that is more suited to code generation is available as part of the [eCore reference platform (§2.6.4.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.refimpl).

### 1.3.2: Narrative

Each resource may include a human readable narrative that contains a summary of the resource, and may be used to represent the content of the resource to a human. The narrative need not encode all the structured data, but SHOULD contain sufficient detail to make it "clinically safe" for a human to just read the narrative. Resource definitions may define what content should be represented in the narrative to ensure clinical safety.

The narrative for a resource is allowed to contain additional information that is not in the structured data, including human-edited content. Such additional information must be in the scope of the definition of the resource, though it is common for the narrative to include additional descriptional information extracted from other referenced resources.

While resources SHOULD always contain narrative, so that to support human-consumption as a fall back, in a strictly managed trading systems where all systems share a common data model, and additional text is unnecessary or even a clinical safety risk, the narrative may be omitted. However implementers should consider carefully before doing this, as it will mean that these resources can only be understood in the limited trading environment, and closed trading partner environments are very likely to open up during the lifetime of the resources they define.

Note that [Contained (§1.2.6.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained) Resources SHALL NOT have a narrative of their own.

The narrative is an xhtml fragment that also includes images if appropriate:

<**[name]** xmlns="http://hl7.org/fhir">

<**status** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [generated | extensions | additional](http://hl7.org/implement/standards/fhir/fhir-book.htm#narrative-status) -->

<**div** xmlns="http://www.w3.org/1999/xhtml"< <!-- Limited xhtml content< --> </div>

</[name]>

#### 1.3.2.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Narrative.status | The status of a resource narrative | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/narrative-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#narrative-status) |

The contents of the *div* element are an XHTML fragment containing only the basic html formatting elements described in chapters 7-11 (except section 4 of chapter 9) and 15 of the HTML 4.0 standard, <a> elements (either name or href), images and internally contained style attributes. The XHTML content must not contain a head, a body element, external stylesheet references, scripts, forms, base/link/xlink, frames, iframes, and objects. The div element must have some non-whitespace content.

<narrative>

<div xmlns="http://www.w3.org/1999/xhtml">This is a simple

example with only plain text</div>

</narrative>

<narrative>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>

This is an <i>example</i> with some <b>xhtml</b> formatting.

</p>

</div>

</narrative>

The inner portion of the div content is often used for the innerHTML property in a browser. In order to simplify processing, the narrative SHALL be encoded so that the character content between the first ">" and the last "<" characters is the content of the <div> element.

Note that the XHTML is contained in general XML, and so there is no support for HTML entities like *&nbsp;* or *&copy;* etc. Unicode characters should be used instead. Note that *&#160;* substitutes for *&nbsp;*.

The narrative content should be in the [language of the resource (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources-definitions.Resource.language), but there is no reason to expect that HTML type tooling would understand the resource *language* element. For this reason, a lang attribute on the <div> should also be used (and see [the note in the HTML 5 specification about use of language (http://www.w3.org/html/wg/drafts/html/master/dom.html#the-lang-and-xml:lang-attributes)](http://www.w3.org/html/wg/drafts/html/master/dom.html#the-lang-and-xml:lang-attributes) ).

The image source references may be a local reference within the resource:

<img src="#a5"/>

This is an [internal reference](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.idref) to an id attribute on an element in the same resource, either an element of type "[Attachment (§1.4.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment)", or a contained [Binary](http://hl7.org/implement/standards/fhir/formats.htm@binary) resource.

<Patient xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>... <img src="#pic1"/>. ....</p>

</div>

</text>

<contained>

<Binary id="pic1" contentType="image/gif">MEKH....SD/Z</Binary>

</contained>

Since the availability of images that are not contained in the resource is not guaranteed, when the resource is presented to a user, the source for any images that are an essential part of the narrative should always be embedded in an attachment or a contained resource.

#### 1.3.2.2: Styling the XHTML

The XHTML fragment in the narrative may be styled using CSS in the normal fashion, using a mix of classes, ids and in-line style elements. Specific CSS stylesheets will be applied to the XHTML when it is extracted from the resource to be displayed to a human to create the presentation desired in the context of use. Authors may fix the following styling aspects of the content:

* bold, italic, underline, strikethrough
* font color, family, and size
* background color, text alignment
* whitespace interpretation
* ordered list number format (since it may be referred to in text)

These style properties are specified in-line using the style attribute. If an equivalent html element exists, such as "i", or "pre", it may be used instead, but note that some of these elements are deprecated in HTML 4 and must not be used in Narrative XHTML (including "u", and "font").

Rendering systems are required to respect any of these rendering styles when they are specified in the XHTML, though appropriate interpretation is allowed (e.g. a low-contrast display for dark room contexts or a high-contrast display for the visually impaired may adjust colors accordingly).

Authors are allowed to specify additional styles and style properties as specified in the CSS specification, but these are extensions to this specification and renderers are not required to honor them. Note, however, the additional rules around styling that apply in the context of [documents (§2.4.6.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document.css).

Note: styles in resources can make use of the styles defined in the standard FHIR stylesheet, which lives here: [http://hl7.org/implement/standards/fhir/fhir.css](file:///D:\reference\HL7\FHIR\book\FHIR%20Specification%20-%20FHIR%20v0.10_files\fhir.css). Since this stylesheet is not referred to directly, rendering systems may take their own copy if they wish. Authoring systems should not depend on these styles being supported in order to render clinical content correctly without trading partner agreement.

### 1.3.3: Internal References

There are 4 cases where elements inside a resource reference each other:

* Inside a [CodeableConcept data type to identify the primary encoding (§1.4.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept)
* An <img src=""/> reference in the narrative, referring to an image found in the resource
* Between elements in the narrative and structured data elements
* Between a ResourceReference and an [contained resource (§1.2.6.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained)

These references are done using an id/idref based approach, where a source element indicates that it has the same content as the target element. The target element has an attribute "id" which must have a unique value within the resource with regard to any other id attributes. The "id" attribute is not in any namespace. The source element reference must refer to an attribute in the same resource (or, for a CodeableConcept, inside the same datatype).

<example>

<target id="a1">

<child>...</child>

</target>

<-- other stuff -->

<source idref="a1">

</example>

In a single resource, this works like xml:id/idref, but there is an important difference: the uniqueness and resolution scope of these id references is within the resource that contains them. If multiple resources are combined into a single piece of XML, such as an [atom feed (§1.3.8.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.atom), duplicate values may occur between resources. This must be managed by applications reading the resources.

Note that all references between the xhtml elements and the data elements must be understood to establish a "derived from" relationship, where the derived content (whether text or data) refers to the source content. Note that this means some references may be forward references (references to elements defined later in the instance).

### 1.3.4: Representing Resources in JSON

Though the representation of FHIR resources is described in XML, FHIR also defines a JSON representation of the resources. The JSON format for the resources follows the standard XML format very closely to make interconversion easy, and so that XPath queries can easily be mapped to query the JSON structures. The formal mime type for this format is application/fhir+json.

Clients are free to choose whether to implement in XML or JSON. Servers must support XML, and can choose to support JSON. Note that systems must declare which format(s) they support. Also, the [reference implementations (§2.6.4.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.refimpl) include bi-direction conversion functionality between the two formats.

The JSON representation is described relative to the XML representation:

* The names for the JSON object members are the same as the names of the elements and attributes in XML, including for elements that may repeat. Property names are case sensitive
* In the data types, the [primitive type (§1.4.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.primitive) integer is represented using a native JSON int, while boolean is represented using JSON's "true" and "false" values. Other primitive types such as string, decimal, etc. are represented as a JSON string, using the same serialization as the XML form (including instant, which is represented as plain text, not in one of the proposed JSON custom date formats)
* Just as in XML, JSON property attributes never have empty values; omit a value if it is empty

There are differences too:

* There are no namespaces in the JSON representation
* The order of properties of an object not significant in the JSON representation, though order within an array must be maintained
* JSON does not have a notion of attributes versus elements, so attributes (xml:id, value) are treated as JSON object members (see below for more details)
* JSON has a notation for arrays, which are used to represent repeating elements. Note that this is the case, even if they do not repeat in the actual instance
* The XHTML <div> element in the Narrative datatype is represented as a single escaped string of XHTML. This is to avoid problems in JSON with mixed content etc. The XHTML most still conform to the rules described above

These differences - particularly the repeating element one, which cannot be avoided - mean that generic XML --> JSON converters are not able to perform correctly. The [reference platforms (§2.6.4.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.refimpl) provide XML <--> JSON conversion functionality that accommodates these FHIR-specific characteristics.

### 1.3.5: JSON representation of primitive elements

FHIR elements with primitive values are represented as a JSON object of the same name with a the value attribute of the element in a "value" property. Except for integer and boolean, native JSON types are not used and values are rendered as strings, to guarantee equivalence of the serialized representation between XML and JSON.

<**date** value="1972-11-30"/>

<**deceased** value="false" />

<**count** value="23" />

is represented in JSON as

"date" : { value: "1972-11-30" }

"deceased" : { value: false }

"count" : { value: 23 }

All XML elements *can* have an 'id' attribute, which is represented in JSON as a property of name "\_id":

<**dob** id="314159" value="1972-11-30" />

is represented in JSON as:

"dob": {

"\_id": "314159",

"value": "1972-11-30"

}

### 1.3.6: Repeating elements

Repeating elements are rendered within a JSON array with the name of the element, so a repeating <dob> element in XML

<**dob** value="2011-11-30" />

<**dob** id="314159" value="1972-11-30" />

is represented in JSON like so:

"dob": [

{ "value": "2011-11-30" },

{ "\_id": "314159", "value": "1972-11-30" }

]

### 1.3.7: JSON representation of Resources, Elements, and Data types

Resources, elements, and datatypes (types that contain named elements of other types) are represented using a JSON object, containing a member for each element in the datatype. Composites can have id attributes, which are converted to JSON members values, in the same manner as described for primitives. It comes before all other members. For example:

<Person>

<name>

<use value="official" />

<given value="Karen" />

<family id="n1" value="Van" />

</name>

<text>

<status value="generated" />

<div xmlns="http://www.w3.org/1999/xhtml">...</div>

</text>

</Person>

is represented in JSON as:

{

"Person" : {

"name" : [{

"use" : { "value" : "official" },

"given" : [{

"value" : "Karen"

}],

"family" : [{

"\_id" : "n1",

"value" : "van"

}]

}],

"text" : {

"status" : { "value" : "generated" },

"div" : "<div xmlns='http://www.w3.org/1999/xhtml'>...</div>"

}

}

Things to note here are:

* Both given and family are repeating XML elements, so they are serialised as an Array whether or not they repeat in this instance
* Because the primitive element 'id' is in a resource, it is serialized as a JSON object
* In the family part of 'name', the '\_id' is added as the first member
* The XHTML content in the 'div' element which is in the Narrative element 'text' is represented as an escaped string in the value property in JSON. The xhtml's root element needs to be a <div> in the xhtml namespace

### 1.3.8: Bundles

A bundle is a [collection of resources in a single document (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle).

#### 1.3.8.1: Atom Bundle Representation

In XML bundles are represented using an Atom format (<http://tools.ietf.org/html/rfc4287>), following this template:

<feed xmlns="http://www.w3.org/2005/Atom">

<title><!-- **1..1** [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) Text statement of purpose --></title>

<id><!-- **1..1** [uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri) Unique uri for this bundle --></id>

<link rel="self" href="[building application url (Service base on REST)]"/><!-- 0..1 -->

<link rel="first" href="[paging: url for first page of result]"/><!-- 0..1 -->

<link rel="previous" href="[paging: url for previous page of result]"/><!-- 0..1 -->

<link rel="next" href="[paging: url for next page of result]"/><!-- 0..1 -->

<link rel="last" href="[paging: url for last page of result]"/><!-- 0..1 -->

<os:totalResults xmlns:os="http://a9.com/-/spec/opensearch/1.1/"/><!-- **0..1** [integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.primitive)

Paging: the total number of results --></os:totalResults>

<updated><!-- **1..1** [instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant) When the bundle was built --></updated>

<author><!-- 0..1 Who created resource? -->

<name><!-- **1..1** [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) Name of Human or Device that authored the resource --></name>

<uri><!-- 0..1 [uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri) Link to the resource for the author --></uri>

</author>

<entry><!-- Zero+ -->

<title><!-- **1..1** [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) Text summary of resource --></title>

<id><!-- **1..1** [uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri) Logical Id (uri) for this resource --></id>

<link rel="self" href="Version Specific reference to Resource"><!-- 0..1 --></link>

<updated><!-- **1..1** [instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant) Last Updated for resource --></updated>

<published><!-- 0..1 [instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant) Time resource copied into the feed --></published>

<author><!-- 0..1 Who created resource? -->

<name><!-- **1..1** [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) Name of Human or Device that authored the resource --></name>

<uri><!-- 0..1 [uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri) Link to the resource for the author --></uri>

</author>

<!-- Tags affixed to the resource (**0..\***): -->

<category term="[Tag Uri]" label="[Tag Label]" scheme="http://hl7.org/fhir/tag"/>

<content type="text/xml"><!-- **1..1** -->

<[ResourceName] xmlns="http://hl7.org/fhir">

<!-- Content for the resource -->

</[ResourceName]>

</content>

<summary type="xhtml"><!-- 0..1 -->

<div xmlns="http://www.w3.org/1999/xhtml"><!-- Narrative from resource --></div>

</summary>

</entry>

<Signature xmlns="http://www.w3.org/2000/09/xmldsig#">

<!-- 0..1 Enveloped Digital Signature (see Atom section 5.1) -->

</Signature>

</feed>

##### Notes

* Logically, a bundle is a set of resources that are prepared to send somewhere for consumption - a "feed". There is no implication that the feed is a standing arrangement (though this is not precluded)
* The order of elements does not matter in an atom feed (but not entries: the order of the entries is important). The order of elements in the atom namespace as documented above does not need to be followed, though it is followed by the FHIR reference platforms
* The title for the feed and the entry are arbitrary human readable content and not to be used for any automated processing. Applications may populate these in any useful way
* Every bundle must have a unique id and that id must be a valid absolute [uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri). UUIDs are recommended (urn:uuid:...)
* The entry element carries the [three pieces of resource metadata (§1.2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.metadata): Id (.id), Version Id (.link), Last Updated (.updated)
* Each entry also carries all the Tags affixed to the resource in the category element. The category element can be used in other ways too
* The entry.id must be an absolute url, the tail element of which is the logical id of the resource. The id is a version independent reference
* The entry.link to self is a version specific reference to the resource.
* When used in a [RESTful implementation](http://hl7.org/implement/standards/fhir/fhir-book.htm#http), the entry.link and entry.id are the URLs of the resource on the system; the version specific link can be used as the basis synchronizing pub/sub systems using the atom bundle with the [updates operation (§2.1.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.history). In other contexts, the values should be literal references to a server if one is available
* Note that the atom specification requires an author for each entry, but if an author is provided in the base feed element, an author is not needed on each entry
* The author of a resource is not explicit in the FHIR resource model; instead it is delegated to the infrastructure. The name is the name of a human author or a device. The uri is a link to the author (possibly a Practitioner resource)
* xml:base elements SHOULD NOT be used and implementations do not need to support it
* The entire bundle can be signed with a single Enveloped Digital Signature as described in the Atom specification (section 5.1)
* The mime type for an bundle when represented in XML is application/atom+xml
* The feed.link element with relationship "self" is assigned no particular meaning the FHIR specification, except in the case of a search operation, but may be used to provide a reference to the source of the feed
* The feed.link elements with relationship "first", "last", "previous" and "next" are used to implement paging in the RESTful interface and allow a client to browse through a multi-page result. See [search/query (§2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query)

##### Bundling versions - deletion

When returning a set of resources or versions of a resource, an entry might indicate that the entry has been *deleted*. Deleted resources are represented in an atom feed as defined by [rfc6721.txt (http://www.rfc-editor.org/rfc/rfc6721.txt)](http://www.rfc-editor.org/rfc/rfc6721.txt) :

<feed xmlns="http://www.w3.org/2005/Atom">

... feed elements and other entries ...

<at:deleted-entry xmlns:at="http://purl.org/atompub/tombstones/1.0"

ref="[Logical Id for deleted resource]" when="[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant) [when deleted]">

<link rel="self" href="[Version Specific reference to Resource]"><!-- 0..1 --></link>

</at:deleted-entry>

... other entries ...

A deleted resource returns a 410 error if it is accessed through the RESTful interface.

##### Resolving references to Resources

Readers of the resources bundles should always look through the resources in the atom feed when a [resource reference](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource) is encountered. The resource reference may have the resource type and a relative url, which is the id of the target, like this:

<institution>

<type value="Organization" />

<reference value="organization/@23" />

</institution>

A reader trying to find the resource this *institution* element identifies should always look through the entries in the atom feed prior to looking anywhere else for the institution. If the feed.id for the resource that contains the link above is http://example.org/, then the absolute URL is http://example.org/organization/@23. If that organization is in the feed, it would look like this:

.. feed ..

<entry>

..

<id>http://example.org/organization/@23<id>

..

<content type="text/xml">

<Organization xmlns="http://hl7.org/fhir">

<!-- Content for the resource -->

</Organization>

</content>

... feed ...

It would also be possible to locate the resource by an absolute url. In this case, the *id* element contains a direct reference to the location of the resource:

<institution>

<type value="Organization" />

<reference value="http://example.org/organization/@23" />

</institution>

If there is no resource in the atom feed with an appropriate URL, then the application may try accessing the provided URL directly or use some other implementation-specific method for resolving how to find the resource.

### 1.3.9: Implementation Notes

* Atom Feeds may be signed following the rules described in the Atom specification. One consequence of signing the document is that URLs, Identifiers and internal references are frozen and cannot be changed. This might be a desired feature, but it may also cripple interoperability between closed eco-systems where [re-identification (§2.6.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.identity) frequently occurs. For this reason, it is recommended that only Document Bundles are signed and then only when all the related resources are found in the bundle.
* FHIR resources make use of id attributes as targets for [internal references with resources](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "formats.idref). These id attributes are unique and resolved within the context of a single resource. When resources are combined into a bundle, different resources may contain duplicate id attributes. Thus it is important to limit the scope of resolution of an id attribute to the resource in which the *id* attribute is declared.

#### 1.3.9.1: JSON Bundle Representation

In JSON bundles are represented using a JSON format that is tailored to the specific needs for bundles. Each element in the Xml feed definition has a JSON corresponding JSON object member with the same name. Here is an example feed returning search results for a person query:

{

"feed" : {

"title" : "Search result",

"updated" : "2012-09-20T12:04:45.6787909+00:00",

"id" : "urn:uuid:50ea3e5e-b6a7-4f55-956c-caef491bbc08",

"link" : [{

"rel" : "self",

"href" : "http://ip-0a7a5abe:16287/fhir/person?format=json"

}],

"category" : [{

"term" : "[Tag Uri]",

"label" : "[Tag Label]",

"scheme" : "http://hl7.org/fhir/tag"

}],

"totalResults" : 12,

"entry" : [{

"title" : "Resource of type Person, with id = 1 and version = 1",

"link" : [{

"rel" : "self",

"href" : "http://fhir.furore.com/fhir/person/@1/history/@1"

}],

"id" : "http://fhir.furore.com/fhir/person/@1",

"updated" : "2012-05-29T23:45:32+00:00",

"published" : "2012-09-20T12:04:47.3012429+00:00",

"author" : [{

"name" : "Grahame Grieve / HL7 publishing committee"

}],

"category" : [{

"term" : "[Tag Uri]",

"label" : "[Tag Label]",

"scheme" : "http://hl7.org/fhir/tag"

}],

"content" : {

"Person" : { ...person content in JSON... }

},

"summary" : "<div xmlns=\"http://www.w3.org/1999/xhtml\">(text summary)</div>",

},

... other entries ....

]

}

}

Note that property names for elements that can repeat are not pluralized for consistency of overall approach. The mime type for a json bundle is also application/fhir+json.

##### Bundling versions - deletion

When returning a set of versions for a resource, a version might indicate a *deletion*. While the XML format follows [RFC 6721 (http://www.rfc-editor.org/rfc/rfc6721.txt)](http://www.rfc-editor.org/rfc/rfc6721.txt) , the JSON format needs to use an entry item to retain the logical order of entries:

.. feed ..

"entry" : [

... other entries ....,

{

"deleted" : "2012-05-29T23:45:32+00:00",

"id" : "http://fhir.furore.com/fhir/person/@1",

"link" : [{

"rel" : "self",

"href" : "http://fhir.furore.com/fhir/person/@1/history/@1"

}],

}, ... other entries ....

]

... feed ...

The entry is known to be deleted because a date of deletion is given. An id must be provided, and a link may be provided.

##### Binary Resources

There are situations where it is useful or required to handle pure binary content as resources. Typically, this is when the binary content is referred to from other FHIR Resources. The resource can contain any content, whether text, image, pdf, zip archive, etc. These resources are [served in their native form on the rest interface (§2.1.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.binary), but can also be represented in XML or JSON, such as when including these resources in a bundle (used when it is convenient to include these in the feed directly rather than leaving them by reference).

When binary resources is represented as XML, it is represented as base64 encoded content along with a content-type, which is the mime-type as it would be specified in HTTP:

<Binary xmlns="http://hl7.org/fhir" contentType="[mime type]">

[Base64 Content]

</Binary>

In JSON, the representation would look like this:

"Binary" : {

"contentType" : "[mime type]",

"content" : "[base64 of data]"

}

Binary resources can also be embedded as [contained resources (§1.2.6.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.contained). If there's a desire to capture metadata about a binary object, an appropriate resource type must be used such as [DocumentReference (§3.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference) or [Picture (§3.35)](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture).

### 1.3.10: XML Schema and Schematron

This specification provides schema definitions for all of the content models described here. The base schema is called "[fhir-base.xsd](http://hl7.org/implement/standards/fhir/fhir-base.xsd)" and defines all of the datatypes and also the base infrastructure types described on this page. In addition, there is a schema for each resource and a common schema [fhir-all.xsd](http://hl7.org/implement/standards/fhir/fhir-all.xsd) that includes all the resource schemas. A customized atom schema [fhir-atom.xsd](http://hl7.org/implement/standards/fhir/fhir-atom.xsd) is provided for validating [bundles (§1.3.8.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.atom).

In addition to the w3c schema files, this specification also provides Schematron files that enforce the various constraints defined for the datatypes and resources. These are packaged as files for each resource as well as a combined fhir-atom.sch file that incorporates the rules for all resources.

XML that is exchanged must be valid against the w3c schema and Schematron, nor is being valid against the schema and Schematron sufficient to be a conformant instance. (This specification makes several rules that cannot be checked by either mechanism.) Exchanged content must not specify the schema or even the schema instance namespace in the resource itself.

**On This Page:**

[Primitive Types (§1.4.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.primitive)

[Data Types (§1.4.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Types)

[Other Types (§1.4.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.other)

## 1.4: Data Types

The FHIR specification defines a set of types that are used for the resource elements. There are two categories of data type: simple / primitive types, imported from XML schema, and complex types, which are re-usable clusters of elements

The data types are available as a [W3C Schema](http://hl7.org/implement/standards/fhir/fhir-base.xsd).

### 1.4.1: Primitive Types

The following table summarizes the primitive types and their simple restrictions that are used in throughout this specification. These types are those defined in the [W3C Schema (1.0) specification part 2 (http://www.w3.org/TR/xmlschema-2/)](http://www.w3.org/TR/xmlschema-2/) , with additional constraints marked in bold.

|  |  |  |
| --- | --- | --- |
| **Primitive Types** | | |
| **FHIR Name** | **Schema type** | **Description** |
| boolean | xs:boolean | Values can be either true or false (**0 and 1 are not valid values**) |
| integer | xs:int | A signed 32-bit integer (for larger values, use decimal) |
| decimal | xs:decimal | A rational number. Note: for implementations, do not use a IEEE type floating point type, instead use something that works like a true decimal, with inbuilt precision (e.g. Java BigDecimal) |
| base64Binary | xs:base64Binary | A stream of bytes, base64 encoded ([RFC 4648 (http://tools.ietf.org/html/rfc4648)](http://tools.ietf.org/html/rfc4648) ) |
| instant | xs:dateTime | An instant in time - **known at least to the second and always includes a timezone**. Note: This type is for system times, not human times (see date and dateTime below). |
| string | xs:string | A sequence of Unicode characters. **Note that strings SHALL not exceed 1MB in size** |
| uri | xs:anyURI | A Uniform Resource Identifier Reference. It can be absolute or relative, and may have an optional fragment identifier ([RFC 3986 (http://tools.ietf.org/html/rfc3986)](http://tools.ietf.org/html/rfc3986) ) |
| date | union of xs:date, xs:gYearMonth, xs:gYear | A date, or partial date (e.g. just year or year + month) as used in human communication. There is no time zone. Dates must be valid dates.  date is a union of the w3c schema types date, gYearMonth, and gYear regex: -?([1-9][0-9]{3,}|0[0-9]{3})-(0[1-9]|1[0-2])-(0[1-9]|[12][0-9]|3[01])(Z|(\+|-)((0[0-9]|1[0-3]):[0-5][0-9]|14:00))? |
| dateTime | union of xs:dateTime, xs:date, xs:gYearMonth, xs:gYear | A date, date-time or partial date (e.g. just year or year + month) as used in human communication. If hours and minutes are specified, a time zone must be populated. Seconds may be provided but may also be ignored. Dates must be valid dates.  date is a union of the w3c schema types dateTime, date, gYearMonth, gYear regex:-?([1-9][0-9]{3,}|0[0-9]{3})-(0[1-9]|1[0-2])-(0[1-9]|[12][0-9]|3[01])T(([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9](\.[0-9]+)?|(24:00:00(\.0+)?))(Z|(\+|-)((0[0-9]|1[0-3]):[0-5][0-9]|14:00))? |
|  | | |
| **Simple Restrictions** | | |
| **FHIR Name** | **Base FHIR Type** | **Description** |
| oid | uri | An OID represented as a URI ([RFC 3001 (http://www.ietf.org/rfc/rfc3001.txt)](http://www.ietf.org/rfc/rfc3001.txt) ): urn:oid:1.2.3.4.5 |
| uuid | uri | A UUID, represented as a URI ([RFC 4122 (http://www.ietf.org/rfc/rfc4122.txt)](http://www.ietf.org/rfc/rfc4122.txt) ): urn:uuid:a5afddf4-e880-459b-876e-e4591b0acc11 |
| code | string | A string which has at least one character and no leading or trailing whitespace, and where there is no whitespace other than single spaces in the contents  regex: [^\s]+([\s]+[^\s]+)\* |
| id | string | A whole number in the range 0 to 2^64-1 (optionally represented in hex), a uuid, an oid, or any other combination of lowercase letters, numerals, "-" and ".", with a length limit of 36 characters  regex: [a-z0-9\-\.]{1,36} |

These types are represented as XML Elements with the value of the type in the value attribute. The name of the element is defined where the type is used. The XML elements may have an [id attribute](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.idref). According to XML schema, leading and trailing whitespace in the value attribute is ignored for the types boolean, integer, decimal, base64Binary, instant, uri, date and dateTime, oid, and uri. The means the schema aware XML libraries give different attribute values to non-schema aware libraries when reading the XML instances. For this reason, the value attribute for these types SHOULD not have leading and trailing spaces. String values should only have leading and trailing spaces if they are part of the content of the value.

In JSON, the data type is represented by an object with two properties: "\_id" for the id attribute, and "value" for the value of the type. For the data types boolean, int and decimal, the value property is a true, false or number as appropriate. All other types are represented as strings, and the whitespace is always significant (i.e. no leading and trailing spaces for non-strings). The JSON value "null" is never used.

The primitive data types can have [extensions](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility) like any other element in a resource.

**Examples**

date (e.g. Date of birth):

<date value="1951-06-04" />

<date id="a1" value="1951-06-04" />

date : {

value : "1951-06-04"

}

date : {

\_id : "a1",

value : "1951-06-04"

}

instant (e.g. creation time of document):

<instant value="1951-06-04T10:57:34+01" />

instant : {

value : "1951-06-04T10:57:34+01"

}

### 1.4.2: Complex Types

These types are represented as XML Elements with child elements with the name of the defined elements of the type. The name of the element is defined where the type is used. Any of the XML elements may have an [id attribute](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.idref). In JSON, the data type is represented by an object with properties named the same as the XML elements. The JSON representation is almost exactly the same, so only the first example has an additional JSON representation.

Complex data types may be "profiled". A [profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) makes a set of rules about which elements must have values, and what the possible values are.

### 1.4.3: Attachment

This type is for containing or referencing attachments - additional data content defined in other formats. The most common use of this type is to include images or reports in some report format such as PDF. However it can be used for any data that has a mime type.

<**[name]** xmlns="http://hl7.org/fhir">

<**contentType** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Mime type of the content, with charset etc. (http://www.rfc-editor.org/bcp/bcp13.txt.htm)](http://www.rfc-editor.org/bcp/bcp13.txt.htm)  -->

<**language** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Human language of the content (BCP-47) (http://tools.ietf.org/html/bcp47.htm)](http://tools.ietf.org/html/bcp47.htm)  -->

<**data** value="[[base64Binary](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.base64Binary)]"/><!-- **0..1** Data inline, base64ed -->

<**url** value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Uri where the data can be found -->

<**size** value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of bytes of content (if url provided) -->

<**hash** value="[[base64Binary](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.base64Binary)]"/><!-- **0..1** Hash of the data (sha-1, base64ed ) -->

<**title** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Label to display in place of the data -->

</[name]>

#### 1.4.3.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Attachment.contentType | The mime type of an attachment | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [BCP 13 (RFCs 2045, 2046, 2047, 4288, 4289 and 2049) (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) |
| Attachment.language | A human language | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |

The *contentType* element must always be populated. It can include charset information and other mime type extensions as appropriate. If there is no character set in the *contentType* then the correct course of action is undefined, though some media types may define a default character set and/or the correct character set may be able to be determined by inspection of the content.

The actual content of the Attachment can be conveyed directly using the *data* element or a *url* reference can be provided. If both are provided, the reference must point to the same content as found in the data. The reference can never be reused to point to some different data (i.e. the reference is version specific). The *url* reference must point to a location that resolves to actual data; some URIs such as cid: meet this requirement.

The *hash* is included so that applications can verify that the contents that a url have not changed.

In many cases where Attachment is used, the cardinality is >1;. A valid use of repeats is to convey the same content in different mime types and languages. Guidance on the meaning of repeating elements MUST be provided in the definition of the repeating resource element or extension that references this type. The language element describes the language of the attachment using the [codes defined in BCP 47 (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) .

**Constraints**

If neither *data* nor a *url* is provided, the value should be understood as an assertion that no content for the specified *mimeType* and/or *xml:lang* is available for the reason stated.

The context of use may frequently make rules about the kind of attachment (and therefore, the kind of mime types) that can be used.

**Examples**

A PDF document:

<document>

<contentType value="application/pdf" />

<language value="en" />

<data value="/9j/4...KAP//Z" /> <!-- covers many lines -->

<title value="Definition of Procedure" />

</document>

document : {

contentType : { value : "application/pdf" },

language : { value : "en" },

data : { value : "/9j/4...KAP//Z"},

title : { value : "Definition of Procedure" }

}

Since the JSON examples have the same structure as the XML, only XML is shown for the rest of the examples.

A reference to a DICOM image via WADO:

<image>

<contentType value="application/dicom" />

<reference value="http://10.1.2.3:1000/wado?requestType=WADO&amp;wado\_details..." />

<hash value="EQH/..AgME" />

</image>

### 1.4.4: Coding

A "*coding*" is a representation of a defined concept using a symbol from a defined "code system" - which may be an enumeration, a list of codes, a full terminology such as SNOMED-CT or LOINC or a formal ontology.

<**[name]** xmlns="http://hl7.org/fhir">

<**system** value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Identity of the terminology system -->

<**code** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** Symbol in syntax defined by the system -->

<**display** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Representation defined by the system -->

</[name]>

The *system* is a URI that references the enumeration, terminology or ontology that defines the *code*. The URI may be an OID (urn:oid:) or a UUID (urn:uuid:), a specially defined URI from [the named systems list (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "terminologies-systems), a url that references a definition of the system or any other URI that uniquely identifies the definitions. This could include a reference to a [ValueSet (§3.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset) stored in a fhir server. OIDs and UUIDs may be registered in the [HL7 OID registry (http://hl7.org/oid)](http://hl7.org/oid) and should be if the content is shared or exchanged across institutional boundaries.

If present, the *code* must be a syntactically correct symbol as defined by the *system*. In some code systems such as SNOMED-CT, the code may be an expression composed of other codes. Note that codes are case sensitive unless specified otherwise by the code system. The *display* is a text representation of the code defined by the *system* and can be used to display the meaning of the code by an application that is not aware of the *system*.

In some cases, the *system* may not be known - only the code is known. In this case, no useful processing of the code may be performed unless the system can be safely inferred by the context. This practice should be avoided where possible in order to future-proof implementations, as information sharing in a wider context is very likely to arise eventually, and codes cannot be used in the absence of a known system.

If the system is present, and there is no code, then this is understood to mean that there is no suitable code in the system in which to represent the code.

If two codings have the same the *system* and *code* then they have the same meaning. Note that if a code system redefines the meaning of codes across different releases, then the different releases must have different values for *system*. If either the *system* or the *code* differs, then how they are related can only be determined by consulting the definitions of the system(s) and any mappings available.

The correct value to use in the *system* for a given code-system can be determined by:

* the [Named Systems List (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-systems) section
* the [HL7 OID Registry (http://www.hl7.org/oid/index.cfm?ref=common)](http://www.hl7.org/oid/index.cfm?ref=common)
* the documentation associated with the code system
* consulting the owner of the code system
* asking on the HL7 vocabulary mailing list

**Constraints**

The context of use (as defined in the resource or applicable profile) usually makes rules about what codes and systems are allowed or required in a particular context by [binding](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies) the element to a value set.

**Examples**

A simple code for headache, in ICD-10:

<code>

<system value="http://hl7.org/fhir/sid/icd-10" />

<code value="G44.1" />

</code>

A SNOMED-CT expression:

<problem>

<system value="http://snomed.info" />

<code value="128045006:{363698007=56459004}" />

</problem>

#### 1.4.4.1: Choosing Coding vs. CodeableConcept

A **Coding** is a simple direct reference to a code in a code system. In practice, such a simple reference is very difficult to use - if a system is using text when the correct codes can't be found, or if two different systems are using different terminologies or a different mix of codes and text, the **Coding** type doesn't provide enough information to make this work. Since such situations are quite a common case, the type **CodeableConcept** is defined, which allows for multiple **Coding** elements and/or a text representation. The **CodeableConcept** is used in resources in preference to the simpler **Coding** except for a few special cases. **Coding** is defined separately mainly for use in profiles, where the context of an explicit use case means that the profile can define a better structure than the general case CodeableConcept.

### 1.4.5: CodeableConcept

A CodeableConcept represents a represents a field that is usually defined by formal reference to one or more terminologies or ontologies, but may also be defined by the provision of text. This is a common pattern in healthcare data.

<**[name]** xmlns="http://hl7.org/fhir">

<**coding**><!-- **0..\*** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) Code defined by a terminology system --></coding>

<**text** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Plain text representation of the concept -->

<**primary** value="[[idref](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.idref)]"/><!-- **0..1** Which code was chosen directly by the user -->

</[name]>

Each "*coding*" is a representation of the concept using a symbol from a defined "code system" - which may be an enumeration, a list of codes, a full terminology such as SNOMED-CT or LOINC, or a formal ontology. The concept may be coded multiple times in different code systems (or even multiple times in the same code systems, where multiple forms are possible, such as with SNOMED-CT). The different codings may have slightly different granularity due to the differences in the definitions of the underlying codes. The ordering of Codings within a CodeableConcept is undefined.

Whether or not *coding* elements are present, the *text* representation of the concept as entered or chosen by the user which most closely represents the intended meaning of the user or concept. Very often the *text* is the same as a *display* of one of the codings. One of the codings may be flagged as the primary - the code that the user actually chose directly. If present, the value of the primary element is an [xml:id (§1.3.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.id) that must match an *id* attribute on one of the codings.

**Constraints**

* If a primary reference is present, it must point to one of the codings (xpath: not(exists(f:primary)) or count(f:coding[@id=current()/f:primary/@value])=1)

The context of use usually makes rules about what codes and systems are allowed or required in a particular context by [binding](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies) the element to a value set.

**Examples**

A simple code for headache initially coded in SNOMED-CT and translated to ICD-10:

<concept>

<coding>

<system value="http://hl7.org/fhir/sid/icd-10" />

<code value="R51" />

</coding>

<coding id="a1">

<system value="http://snomed.info" />

<code value="25064002" />

<display value="Headache" />

</coding>

<text value="general headache" />

<primary value="a1" />

</concept>

A concept represented in an institution's local coding systems for unit for which no UCUM equivalent exists:

<unit>

<coding>

<system value="urn:oid:2.16.840.1.113883.19.5.2" />

<code value="tab" />

<display value="Tablet" />

</coding>

<coding>

<system value="http://unitsofmeasure.org" />

</coding>

</unit>

A SNOMED-CT expression:

<diagnosis>

<coding>

<system value="http://snomed.info" />

<code value="128045006:{363698007=56459004}" />

</coding>

<text value="Cellulitis of the foot" />

</diagnosis>

In this case, there is no display element, because no display is defined for Snomed-CT expressions.

### 1.4.6: Choice

A code taken from a short list of codes that are not defined in a formal code system. Choice is generally used for things like pain scales, questionnaires or formally defined assessment indexes. The possible codes may be ordered with some arbitrarily defined scale. Note: Choice is not an appropriate data type to use when the possible codes are defined as a value set from a formal code system or otherwise stored on a terminology server.

<**[name]** xmlns="http://hl7.org/fhir">

<**code** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** Selected code -->

<**option**> <!-- **1..\*** List of possible code values -->

<**code** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** Possible code -->

<**display** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Display for the code -->

</option>

<**isOrdered** value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If order of the values has meaning -->

</[name]>

The *code* is the selected value. A list of possible options for code must be provided; at least a code must be provided for each *value*. The selected code must be found in the list of possible codes.

If isOrdered is true, then the values have an inherent meaningful order and the list of values must be provided in the correct order in the instance.

**Example**

The results on a urinalysis strip:

<value>

<code value="+" />

<option>

<code value="neg" />

</option>

<option>

<code value="trace" />

</option>

<option>

<code value="+" />

</option>

<option>

<code value="++" />

</option>

<option>

<code value="+++" />

</option>

<isOrdered value="true" />

</value>

### 1.4.7: Quantity

A measured amount (or an amount that can potentially be measured).

<**[name]** xmlns="http://hl7.org/fhir">

<**value** value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **0..1** Numerical value (with implicit precision) -->

<**comparator** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Relationship of stated value to actual value](http://hl7.org/implement/standards/fhir/fhir-book.htm#quantity-comparator) -->

<**units** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Unit representation -->

<**system** value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** System that defines coded unit form -->

<**code** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** Coded form of the unit -->

</[name]>

#### 1.4.7.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Quantity.comparator | how the Quantity should be understood and represented | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/quantity-comparator](http://hl7.org/implement/standards/fhir/fhir-book.htm#quantity-comparator) |

The *value* contains the numerical value of the quantity, including an implicit precision. If no comparator is specified, the value is a point value (i.e. '='). The *comparator* element can never be ignored.

The *units* element contains a displayable unit that defines what is measured. The units may additionally be coded in some formal way using the *code* and the *system* (see [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) for further information about how to use the *system* element).

If the units are able to be coded in UCUM and a code is provided, it SHOULD be a UCUM code. If a UCUM unit is provided in the *code* then a canonical value can be generated for purposes of comparison between quantities. Note that the *units* element will often contain text that is actually a valid UCUM unit, but it cannot be assumed that it does.

**Constraints**

* If a code for the units is present, the system must also be present (xpath: not(exists(f:code)) or exists(f:system))

The context of use may frequently define what kind of quantity this is and therefore what kind of units can be used. The context of use may additionally require a *code* from a particular *system*. The context of use may also restrict the values for the *value* or *range*.

#### 1.4.7.2: Defined Variations on Quantity

These are used as types in resource content models, but they are really just a Quantity with some rules:

|  |  |
| --- | --- |
| Age | The unit must be an amount of time and a UCUM unit must be provided, and the value must be positive |
| Count | The value must a whole number and the UCUM unit must be "1" |
| Money | The unit must be a currency and the code must from ISO 4217 (system = "urn:std:iso:4217") |
| Distance | The unit must be an amount of length and a UCUM unit must be provided. |
| Duration | The unit must be an amount of time and a UCUM unit must be provided. |

**Examples**

A duration:

<time>

<value value="25" />

<units value="sec" />

<system value="http://unitsofmeasure.org" />

<code value="s" />

</time>

A concentration where the value was out of range:

<result>

<value value="40000" />

<comparator value="&gt;" />

<units value="mcg/L" />

<system value="http://unitsofmeasure.org" />

<code value="ug" />

</result>

An amount of prescribed medication:

<dose>

<value value="3" />

<units value="capsules" />

<system value="http://snomed.info" />

<code value="385049006" />

</dose>

A price (coded using currency codes defined in ISO 4217):

<cost>

<value value="25.45" />

<units value="US$" />

<system value="urn:std:iso:4217" />

<code value="USD" />

</cost>

### 1.4.8: Range

A set of ordered Quantity values defined by a low and high limit.

A Range specifies a set of possible values; usually, one value from the range applies (e.g. "give the patient between 2 and 4 tablets"). Ranges are typically used in instructions.

<**[name]** xmlns="http://hl7.org/fhir">

<**low**><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Low limit --></low>

<**high**><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) High limit --></high>

</[name]>

The *units* and *code*/*system* elements of the *low* or *high* elements must match. If the *low* or *high* elements are missing, the meaning is that the low or high boundaries are not known and therefore neither is the range.

The *range* flag on the *low* or *high* elements cannot be present. Note that the Range type should not be used to represent out of range measurements: A quantity type with the comparator element should be used instead.

The low and the high values are inclusive, and are assumed to have arbitrarily high precision. E.g. the range 1.5 to 2.5 includes 1.50, and 2.50 but not 1.49 or 2.51.

**Constraints**

* Quantity values cannot have a range when used in a Range (xpath: not(exists(f:low/f:range) or exists(f:high/f:range)))

**Examples**

Range of Quantity (distance):

<estimate>

<low>

<value value="1.6" />

<units value="m" />

</low>

<high>

<value value="1.9" />

<units value="m" />

</high>

</estimate>

### 1.4.9: Ratio

A ratio of two Quantity values - a numerator and a denominator.

<**[name]** xmlns="http://hl7.org/fhir">

<**numerator**><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) The numerator --></numerator>

<**denominator**><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) The denominator --></denominator>

</[name]>

Common factors in the numerator and denominator are not automatically cancelled out. The Ratio data type is used for titers (e.g., "1:128") and other quantities produced by laboratories that truly represent ratios. Ratios are not simply "structured numerics" - for example blood pressure measurements (e.g. "120/60") are not ratios. In addition, ratios are used where common factors in the numerator and denominator do not cancel out. The most common example of this is where the ratio represents a unit cost, and the numerator is a currency (e.g. 50/$10).

**Constraints**

The context of use may require particular types of Quantity for the numerator or denominator.

**Examples**

Titer (Ratio of integer:integer)

<result>

<numerator>

<value value="1" />

</numerator>

<denominator>

<value value="128" />

</denominator>

</result>

Unit cost (Ratio of :Quantity):

<charge>

<numerator>

<value value="103.50" />

<units value="US$" />

<code value="USD" />

<system value="urn:std:iso:4217" />

</numerator>

<denominator>

<value value="1" />

<units value="day" />

<code value="day" />

<system value="http://unitsofmeasure.org" />

</denominator>

</charge>

### 1.4.10: Period

A time period defined by a start and end time.

A period specifies a range of times. The context of use will specify whether the entire range applies (e.g. "the patient was an inpatient of the hospital for this time range") or one value from the period applies (e.g. "give to the patient between 2 and 4 pm").

<**[name]** xmlns="http://hl7.org/fhir">

<**start** value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** The start of the period -->

<**end** value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** The end of the period, if not ongoing -->

</[name]>

If the *start* element is missing, the start of the period is not known. If the *end* element is missing, it means that the period is ongoing.

The end value includes any matching date/time. For example, the period 2011-05-23 to 2011-05-27 includes all the times of 23rd May through to the end of the 27th May.

**Examples**

23rd May 2011 to 27th May, including 27th May:

<coverage>

<start value="2011-05-23" />

<end value="2011-05-27" />

</coverage>

### 1.4.11: SampledData

Data that comes from a series of measurements taken by a device, with upper and lower limits. There may be more than one dimension in the data.

A SampledData provides a concise way to handle the data produced by devices that sample a physical particular state at a high frequency. A typical use for this is for the output of an ECG or EKG device.

<**[name]** xmlns="http://hl7.org/fhir">

<**origin**><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Zero value and units --></origin>

<**period** value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **0..1** Number of milliseconds between samples -->

<**factor** value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **0..1** Multiply data by this before adding to origin -->

<**lowerLimit** value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **0..1** Lower limit of detection -->

<**upperLimit** value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **0..1** Upper limit of detection -->

<**dimensions** value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of sample points at each time point -->

<**data** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Decimal values with spaces, or "E" | "U" | "L" -->

</[name]>

The digits are a set of decimal values separated by a single space (Unicode character u20). In addition to decimal values, the special values "E" (error), "L" (below detection limit) and "U" (above detection limit) can also be used. If there is more than one dimension, the different dimensions are interlaced - all the data points for a particular time are represented together.

None of the elements in a SampledData are mandatory because the SampledData type is frequently used with devices where one usage carries just the *data* element, and the values of the other elements are represented elsewhere (see [Device Log (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) and [Device Capabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities)). At least one element must always be populated. The data is not interpretable without at least *origin*, *period*, and *dimensions*. When carried in an [Observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation), these 3 elements and *data* must be populated for the SampledData to be properly populated. The default value for *factor* is 1.

**Example**

The output from an EKG device:

<sampledData>

<origin>

<value value="0"/>

<units value="μV"/>

<system value="http://unitsofmeasure.org"/>

<code value="uV"/>

</origin>

<period value="2"/>

<scale value="2.5"/>

<dimensions value="1"/>

<data value="-4 -13 -18 -18 -18 -17 -16 -16 -16 -16 -16 -17 -18 -18 -18 ...."/>

</sampledData>

### 1.4.12: Identifier

An identifier intended for use external to the FHIR protocol. As an external identifier, they may be changed or retired due to human or system process and errors.

<**[name]** xmlns="http://hl7.org/fhir">

<**use** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [The use of this identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#identifier-use) -->

<**label** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Description of identifier -->

<**system** value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** The namespace for the identifier -->

<**key** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** The value that is unique -->

<**period**><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Time period when id was valid for use --></period>

<**assigner**><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Organisation that issued id (may be just text) --></assigner>

</[name]>

#### 1.4.12.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Identifier.use | Identifies the use for this identifier, if known | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/identifier-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#identifier-use) |

The *system* referred to by means of a URI defines how the identifier is defined (i.e. how the key value is made unique). It might be a specific application or a recognized standard/specification for a set or identifiers or a way of making identifiers unique. The *key* must be unique within the defined *system* and have a consistent meaning wherever it appears. Both *system* and *key* values are always case sensitive.

FHIR defines [some useful URIs directly (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-systems). OIDs (urn:oid:) and UUIDs (urn:uuid:) may be registered in the [HL7 OID registry (http://hl7.org/oid)](http://hl7.org/oid) and should be if the content is shared or exchanged across institutional boundaries. If the identifier itself is naturally globally unique (i.e. an OID, a UUID, or a URI with no trailing local part), then the *system* must be "urn:ietf:rfc:3986", and the URI would be in the *key*.

In some cases, the system may not be known - only the key is known (e.g. a simple device that scans a barcode), or the system is known implicitly (simple exchange in a limited context, often driven by barcode readers). In this case, no useful matching may be performed using the key unless the system can be safely inferred by the context. This practice should be avoided where possible in order to future-proof implementations, as information sharing in a wider context is very likely to arise eventually.

The *assigner* is used to indicate what registry/state/facility/etc. assigned the identifier.

**Examples**

A primary key from an application table (an OID in the space allocated by HL7 to some organisation to further sub-allocate):

<identifier>

<use value="official" />

<system value="urn:oid:2.16.840.1.113883.16.4.3.2.5" />

<key value="123" />

</identifier>

A patient identifier defined by a hospital:

<identifier>

<use value="official" />

<system value="http://www.acmehosp.com/patients" />

<key value="44552" />

<period>

<start value="2003-05-03" />

</period>

</identifier>

In this case, the period is used to track when the identifier was first assigned to the patient.

An identifier that refers to a patient FHIR resource on a particular system:

<identifier>

<system value="urn:ietf:rfc:3986" />

<key value="http://pas-server/xxx/patient/@443556" />

</identifier>

This is not a resource reference - it's a logical reference by the patient identifier.

A UUID:

<identifier>

<use value="temp" />

<system value="urn:ietf:rfc:3986" />

<key value="urn:uuid:a76d9bbf-f293-4fb7-ad4c-2851cac77162" />

</identifier>

UUIDs are often used for temporary identifiers, though this is not necessary.

A US SSN:

<identifier>

<use value="usual" />

<label value="SSN" />

<system value="http://hl7.org/fhir/sid/us-ssn" />

<key value="000111111" />

</identifier>

Notes:

* US SSNs are often presented like this: 000-11-1111, the dashes are for presentation and should be removed, as specified in the [definition of ssn-us (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.identifiersystems)
* The use of "usual" means that this institution prefers to use SSN when identifying the patient

A medical record number assigned on 5-July 2009:

<identifier>

<use value="usual" />

<label value="MRN" />

<system value="urn:oid:0.1.2.3.4.5.6.7" />

<key value="2356" />

<period>

<start value="2009-07-05" />

</period>

</identifier>

### 1.4.13: HumanName

A name of a human with text, parts and usage information.

Names may be changed or repudiated. People may have different names in different contexts. Names may be divided into parts of different type that have variable significance depending on context, though the division into parts does not always matter. With personal names, the different parts may or may not be imbued with some implicit meaning; various cultures associate different importance with the name parts and the degree to which systems must care about name parts around the world varies widely.

<**[name]** xmlns="http://hl7.org/fhir">

<**use** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [The use of this name](http://hl7.org/implement/standards/fhir/fhir-book.htm#name-use) -->

<**text** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Text representation of the full name -->

<**family** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** Family name (often called 'Surname') -->

<**given** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** Given names (not always 'first'). Includes middle names -->

<**prefix** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** Parts that come before the name -->

<**suffix** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** Parts that come after the name -->

<**period**><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Time period when name was/is in use --></period>

</[name]>

#### 1.4.13.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| HumanName.use | The use of a human name | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/name-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#name-use) |

The *text* element specifies the entire name as it should be represented. This may be provided instead of or as well as specific parts. Applications updating a name must ensure either that the text and the parts are in agreement, or that only one of the two is present.

Note that the order of the parts within a given part type has significance and must be observed. The appropriate order between family name and given names depends on culture and context of use.

**Example**

Full name of Peter James Chalmers.

<name>

<use value="usual" />

<family value="Chalmers" />

<given value="Peter" />

<given value="James" />

</name>

[Further examples (§4.2.1.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes-examples.HumanName)

[**vCard (http://tools.ietf.org/html/rfc6350)**](http://tools.ietf.org/html/rfc6350) **Mappings**

* HumanName.text = vCard "FN" field
* HumanName.use = use of the vCard "TYPE" parameter
* HumanName.family, .given, .prefix, .suffix = parts of vCard "N" field. Note that there is no FHIR equivalent for the poorly defined "additional" name field. In FHIR, given names go in "middle" names
* The vCard nickname corresponds to a name with the use "nickname"

### 1.4.14: Address

A postal address. There are a variety of postal address formats defined around the world. Postal addresses are often also used to record a location that can be visited to find a patient or person.

<**[name]** xmlns="http://hl7.org/fhir">

<**use** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [The use of this address](http://hl7.org/implement/standards/fhir/fhir-book.htm#address-use) -->

<**text** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Text representation of the address -->

<**line** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** Line of an address -->

<**city** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name of city, town etc. -->

<**state** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Sub-unit of country (abbreviations ok) -->

<**zip** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Post code for area -->

<**country** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Country (can be ISO 3166 3 letter code) -->

<**period**><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Time period when address was/is in use --></period>

</[name]>

#### 1.4.14.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Address.use | The use of an address | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/address-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#address-use) |

The *text* element specifies the entire address as it should be represented. This may be provided instead of or as well as the specific parts. Applications updating an address must ensure either that the text and the parts are in agreement, or that only one of the two is present.

**Constraints**

**Example**

HL7 office's address.

<address>

<use value="work" />

<text value="1050 W Wishard Blvd

RG

5th floor

Indianapolis, IN 46240" />

<line value="1050 W Wishard Blvd" />

<line value="RG 5th floor" />

<city value="Indianapolis" />

<state value="IN" />

<zip value="46240" />

</address>

[Further examples (§4.2.1.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes-examples.Address)

[**vCard (http://tools.ietf.org/html/rfc6350)**](http://tools.ietf.org/html/rfc6350) **Mappings**

* Address.text = vCard "ADDRESS" "LABEL" parameter
* Address.use = vCard "TYPE" parameter
* Address.line = vCard "street" list component
* Address.city = vCard "locality" list component
* Address.state = vCard "region" list component
* Address.zip = vCard "code" list component
* Address.country = vCard "country" list component

### 1.4.15: Contact

All kinds of technology-mediated contact details for a person or organisation, including telephone, email, etc.

<**[name]** xmlns="http://hl7.org/fhir">

<**system** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [What kind of contact this is](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-system) -->

<**value** value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** The actual contact details -->

<**use** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [How to use this address](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-use) -->

<**period**><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Time period when the contact was/is in use --></period>

</[name]>

#### 1.4.15.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Contact.system | What kind of contact this is | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/contact-system](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-system) |
| Contact.use | How to use this address | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/contact-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-use) |

If capturing a phone, fax or similar contact, the value should be a properly formatted telephone number according to [ITU-T E.123 (http://www.itu.int/rec/T-REC-E.123-200102-I/e)](http://www.itu.int/rec/T-REC-E.123-200102-I/e) . However, this is frequently not possible due to legacy data and/or recording methods.

**Constraints**

* A system is required if a value is provided. (xpath: not(exists(f:value)) or exists(f:system))

**Example**

Home phone number:

<telecom>

<system value="phone" />

<value value="+15556755745" />

<use value="home" />

</telecom>

[Further examples (§4.2.1.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes-examples.Contact)

### 1.4.16: Schedule

A schedule that specifies an event that may occur multiple times. Schedules are not used for recording when things did happen, but when they are expected or requested to occur. A schedule can be either a list of events - periods on which the event occurs, or a single event with repeating criteria, or just repeating criteria with no actual event.

Note: a possible enhancement to this is to have the repeat content repeat with each event. This is richer and more complex - is the added functionality useful?

<**[name]** xmlns="http://hl7.org/fhir">

<**event**><!-- **0..\*** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) When the event occurs --></event>

<**repeat**> <!-- **0..1** Only if there is none or one event -->

<**frequency** value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Event occurs frequency times per duration -->

<**when** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Event occurs duration from common life event](http://hl7.org/implement/standards/fhir/fhir-book.htm#event-timing) -->

<**duration** value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **1..1** Repeating or event-related duration -->

<**units** value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [The units of time for the duration](http://hl7.org/implement/standards/fhir/fhir-book.htm#units-of-time) -->

<**count** value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of times to repeat -->

<**end** value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When to stop repeats -->

</repeat>

</[name]>

#### 1.4.16.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Schedule.repeat.when | A real world event that a schedule is related to | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/event-timing](http://hl7.org/implement/standards/fhir/fhir-book.htm#event-timing) |
| Schedule.repeat.units | A unit of time (units from UCUM) | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/units-of-time](http://hl7.org/implement/standards/fhir/fhir-book.htm#units-of-time) |

If events are specified, at least a low must be specified for each event. If no high is specified, the event is assumed to last a limited but unknown time as clinically relevant.

If the schedule has repeating criteria, the repeat can occur a given number of times per the specified duration or in relation to some real world event. Also, if the event repeats, a time to end the schedule can be specified, either by specifying a count number of times it can occur or a date at which to end the schedule. If no end condition is specified, the Schedule will terminate on some criteria that are expressed elsewhere.

**Constraints**

* There can only be a repeat element if there is none or one event (xpath: not(exists(f:repeat)) or count(f:event) < 2)
* On Schedule.repeat: At most, only one of count and end can be present (xpath on f:Schedule/f:repeat: not(exists(f:count) and exists(f:end)))
* On Schedule.repeat: Either frequency or when must be present, but not both (xpath on f:Schedule/f:repeat: exists(f:frequency) != exists(f:when))
* On Schedule.repeat.duration: duration must be a positive value (xpath on f:Schedule/f:repeat/f:duration: @value > 0 or not(@value))

**Example**

A series of appointments for radiotherapy:

<schedule>

<event>

<start value="2012-01-07T09:00" />

<end value="2012-01-07T13:00" />

</event>

<event>

<start value="2012-01-14T09:00" />

<end value="2012-01-14T13:00" />

</event>

<event>

<start value="2012-01-22T11:00" />

<end value="2012-01-22T15:00" />

</event>

</schedule>

BID (twice a day) (no start or end specified):

<schedule>

<repeat>

<frequency value="2" />

<duration value="1" />

<units value="d" />

</repeat>

</schedule>

1/2 an hour before breakfast for 10 days from 23-Dec 2011:

<schedule>

<event>

<start value="2011-12-23" />

</event>

<repeat>

<when value="ACM" />

<duration value="30" />

<units value="min" />

<end value="2012-01-02" />

</repeat>

</schedule>

Note that the end date is inclusive like the high date of a Period.

### 1.4.17: Other Types

The following types are defined as part of the data types, but are documented elsewhere in the specification:

* [**Resource (§1.2.2)**](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.metadata) - The conceptual base class for all resources
* [**ResourceReference**](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource) - for references from one resource to another
* [**Extension**](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility) - used to convey additional data in a resource
* [**Narrative**](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.Narrative) - Conveys a human readable representation of the content of a resource

**On This Page:**

[Bindings](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.bindings)

[References (§1.5.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.references)

## 1.5: Terminologies: Using Codes

Many elements in the FHIR resources are assigned a type of [code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code), [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) or [CodeableConcept (§1.4.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept). These elements contain codes that are associated with defined meanings defined by frameworks of varying sophistication and size. In some simple cases, the set of codes is a enumeration, a short list defined specifically for the element. In other cases, the list of codes is taken from a large and complex terminology or ontology such as SNOMED-CT or OBO.

All these elements of type [code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code), [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) or [CodeableConcept (§1.4.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) are given a "binding name" that defines the set of possible codes that can be used in the element in question.

### 1.5.1: code

For simple elements with type [code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code), the element is either bound to a code list - a list of defined codes, or the binding references some external standard that defines the set of valid codes that can be used (typical examples of references are [Mime Types (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) , [Language Codes (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) , [UCUM (http://unitsofmeasure.org)](http://unitsofmeasure.org/) , etc.).

The value of an element of type *code* SHALL be one of the codes defined by the code list or reference. Code comparison is always case sensitive for codes unless the codes are defined by a reference, and the reference specifically sates otherwise.

No other codes can be used in an instance. If the binding is a code list, the list of codes may be extended in subsequent releases of the specification. Profiles may state rules on which codes may be used in particular contexts, but cannot define new or additional codes for these elements.

### 1.5.2: CodeableConcept / Coding

For elements with type [CodeableConcept (§1.4.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) or [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding), the binding refers to a [Value Set (§3.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset) that defines a list of concepts along with the code/system pairs that refer to them. Code System values are always case sensitive. Different code systems make their own rules as to whether the codes they define are case sensitive or not. The binding to the value set may be labelled as just an example.

If the binding is not an example binding, then an code/system pair in the instance SHOULD refer to one of the concepts that is a member of the value set.

Bindings to value sets provided as part of the specification are always specific to the version of the value set published with the specification. The value set may be sealed by defining a simple list of enumerated codes, or it may include codes by their properties, in which case the list of valid concepts may grow or change over time.

Profiles can redefine the binding and are able to be much more precise about exactly which codes can be used for these elements (see [Binding Control (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.binding) for more detail).

### 1.5.3: Reference Tables

The following reference tables are provided to help implementers:

* [Systems List (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-systems): Some known system identifiers suitable for use in the *system* element of CodeableConcept, Coding, and Identifier elements
* [Bindings List (§5.1.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-bindings): a full list of the binding names defined for all FHIR resources
* [Code systems (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes): Code systems defined as part of this specification
* [Value Sets (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-valuesets): Value sets defined as part of this specification
* [v2 Namespaces list (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-v2): A list of v2 tables that can be used in resources
* [v3 Namespaces list (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-v3): A list of v3 code systems and value sets used in FHIR

**On This Page:**

[Extensibility (§1.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.root)

[Must Understand](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.mustUnderstand)

[Defining Extensions (§1.6.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.definition)

## 1.6: Extensibility

This exchange specification is based on generally agreed common requirements across healthcare - covering many jurisdictions, domains, and different functional approaches. As such, it is common for specific implementations to have valid requirements that will not be directly included in this specification. Incorporating all of these requirements would make this specification very cumbersome and difficult to implement. Instead, this specification expects that these additional distinct requirements will be implemented as extensions.

As such, extensibility is a fundamental part of the design of this specification. Every element in a resource may have extension child elements to represent additional information that is not part of the basic definition of the resource. Conformant applications are not allowed to reject resources because they contain extensions, though they may need to reject resources because of the specific contents of the extensions.

Note that, unlike in many other specifications, there can be no stigma associated with the use of extensions by any application, project, or standard - regardless of the institution or jurisdiction that uses or defines the extensions. The use of extensions is what allows the FHIR specification to retain a core simplicity for everyone.

In order to make the use of extensions safe and manageable, there is a strict governance applied to the definition and use of extensions. Though any implementer is allowed to define an extension, there is a set of requirements that must be met as part of the definition of the extension.

### 1.6.1: Extensibility Element

Every element in a resource includes an optional "extension" element that may be present any number of times in the element. The extension element appears as the first child, prior to any other defined child elements. This is the content model of the extension as it appears in each resource:

<**[name]** xmlns="http://hl7.org/fhir">

<**url** value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **1..1** identifies the meaning of the extension -->

<**isModifier** value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If extension modifies other elements/extensions -->

<**value[x]**><!-- **0..1** Value of extension --></value[x]>

</[name]>

Notes:

* The *url* is a mandatory field, and identifies an extension definition in a [resource profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) that defines the content and meaning of the extension.
* *isModifier* is used to indicate that this value influences the interpretation, meaning or understanding of other elements. Its use is further discussed below
* The actual content of the extension consists of either a single value in the *value[x]* element, or it can be extended itself with other extensions, each with their own defining url and content
* The *url* and *isModifier* elements cannot have extensions themselves
* An extension must have either a value (i.e. a value[x] element) or child extensions. The value element must have content, and/or an id attribute that is the target of a reference from the Narrative
* When an extension is the target of an internal reference, the reference is always to the value of the extension. An extension is only allowed to be the target of an reference when it has no value[x]

The *value[x]* element has the [x] replaced with the title-cased name of one of the defined types, and the contents as defined for that type, or another extension. The value type may be one of the following:

* [integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)
* [decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)
* [dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)
* [date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date)
* [instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)
* [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)
* [uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)
* [boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)
* [code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code) - if the extension definition provides a binding to a suitable set of codes
* [base64Binary](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.base64Binary)
* [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)
* [CodeableConcept (§1.4.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept)
* [Attachment (§1.4.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment)
* [Identifier (§1.4.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier)
* [Quantity (§1.4.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity)
* [Choice (§1.4.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Choice)
* [Range (§1.4.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Range)
* [Period (§1.4.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period)
* [Ratio (§1.4.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio)
* [HumanName (§1.4.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.HumanName)
* [Address (§1.4.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address)
* [Contact (§1.4.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact)
* [Schedule (§1.4.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule)
* [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.ResourceReference) - a reference to another resource

Nested extensions are used where the original definition of the extension defines complex content (i.e. multiple parts of the extension, not a simple data type). If the value of the extension themselves need extending, these extensions go in the content of the value[x] element.

Here is an example of a name with a simple extension for a tribal name:

<name>

<extension>

<url value="http://hl7.org/fhir/profile/@iso-21090#name-use" />

<valueCode value="I" />

</extension>

<text value="Chief Red Cloud"/>

</name>

The proper use of the URL value is discussed below.

Extending a patient with an opt-in status for a clinical trial, with 3 fields: status, date of recording, and person who recorded:

<Patient>

<extension>

<extension>

<url value="http://acme.org/fhir/profiles/@main#trial-status-code" />

<valueCode value="unsure" />

</extension>

<extension>

<url value="http://acme.org/fhir/profiles/@main#trial-status-date" />

<valueDate value="2009-03-14" />

</extension>

<extension>

<url value="http://acme.org/fhir/profiles/@main#trial-status-who" />

<valueResourceReference>

<type value="Practitioner" />

<reference value="../Practitioner/@example" />

</valueResourceReference>

</extension>

<url value="http://acme.org/fhir/profiles/@main#trial-status" />

</extension>

<!-- other data for patient -->

</Patient>

Note that extensions come first in the extension, prior to the *url* element.

### 1.6.2: isModifier

As well as providing additional information, extensions may be used to modify the meaning of other existing elements or even to negate their meanings. As an example, an implementation may wish to add a "certainty" extension to the AllergyIntolerance to indicate that some allergies are only suspected. If the extension had a value of "highly doubtful", then it would change the understanding of the allergy/intolerance, and implementations should not ignore this. Modifying the meaning of other elements makes these particular extensions unsafe to ignore, and so this must be explicitly labelled in the instance.

If the application processing the content of a resource does not recognize an extension that is labeled "IsModifier", and the data from element it extends is processed by the application, the application SHALL either refuse to process the data, or carry a warning concerning the data along with any action or output that results from processing the data.

Here is an Australian example where for cultural reasons, certain names that have been used previously must never be mentioned again:

<name>

<extension>

<url value="http://hl7.org/fhir/profile/@iso-21090#name-use" />

<isModifier value="true" />

<valueCode value="DN" />

</extension>

<text value="Arinyoo"/>

</name>

Because the intent of the name use code is that this name should not actually be used as if it were the patient's name, the extension is labelled "isModifier" = it is not safe to use this name unless you understand the extension.

Servers and background processes that move resources around are not "processing the data of the resource", and these applications are not required to check for unknown extensions. Any process that copies data out of a resource for use in another context (display to a human, decision support, exchange in another format that doesn't support extensions) is processing the data.

Note that it must always be safe to show the narrative to humans; any extension that is labeled as "IsModifier" must be represented in the narrative. Applications are required to ignore extensions that they do not recognize if their "isModifier" element is missing or set to false.

### 1.6.3: Defining Extensions

Extensions may be defined by any project or jurisdiction, up to and including international standards organizations such as HL7 itself, and are published as part of a [Resource Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile). Extensions are always defined against some particular context - the type of element that they may be used to extend. The following are possible contexts for an extension:

|  |  |  |
| --- | --- | --- |
| **Context type** | **Context format** | **Examples** |
| A particular element (including the root) in a single resource | The element path for that element | Profile.resource.element; Person |
| A particular element (including the root) in a particular data type | The data type name for primitive types or the element path for complex data types | Address.part.value; string |
| A particular context in one of the mapped reference models | The name of the reference model followed by the mapping path | RIM: Act[moodCode="EVN"] |
| Another extension | The profile uri of the extension followed by the extension code | http://myextensions.org#someExtension |
| A set of some combination of the above | As above, separated by ';' | Address; Contact |

In addition, an extension definition might apply additional constraints with regards to particular element values of the target that make its use appropriate. Extensions SHALL only be used on a target for which they are defined.

Each extension is defined using the following fields:

|  |  |  |
| --- | --- | --- |
| Code | Required | The name that is used as a code in a resource to identify this extension - unique in the context of the defining profile |
| Context | Required | The context of this extension. See above. The context has two parts: a type, and a path which supplies the details |
| Short Defn | Required | A brief description of the extension used in the XML descriptions when the extension is referenced in a profile |
| Definition | Required | A formal statement of the meaning of the content of the field |
| Requirements | Optional | Identifies the reason the extension is needed |
| Comments | Optional | Additional other information about the extension, including information such as use notes |
| Cardinality | Required | The cardinality of this extension. Specifying a minimum cardinality of 1 means that if the source system declares that it conforms to an extension that declares a type including this extension, this extension must be included in the resource. Cardinality can be constrained but not loosened in profiles that reference this extension |
| Type | Required | The type(s) of the extension. This must be a valid FHIR data type as described above, or "Extension: x,y,z" which indicates that the extension codes x,y, and z will be contained in the extension |
| XPaths | Optional | One or more XPath statements that must evaluate to true when the extension is used |
| Must Understand | Required | Whether the extension must be understood by any system reading the resource. There are 3 possible values: "true" - the extension must be understood, "false" - the extension does not need to be understood, and "sender" - the sender can decide whether the extension needs to be understood |
| RIM Mapping | Conditional | The formal mapping from this extension to the RIM. Required for HL7-defined extensions that apply to resources with RIM mappings, but may be optional in other contexts |
| v2 Mapping | Optional | Mapping to a v2 segment/field/etc., if desired and appropriate. |
| Binding | Conditional | For the types CodeableConcept and Coding. See [Terminologies](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies) |

Notes:

* Mappings are not required to be computable (i.e. executable logic). Mappings to other specifications can also be provided.

Whenever resources containing extensions are exchanged, the definitions of the extensions must be available to all the parties that share the resources. Each extension contains a URI that references the source of the definitions as a Resource Profile. The source SHOULD be a literal reference, such as an http: url that refers to an end-point that responds with the contents of the definitions - preferably a [FHIR RESTful server](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) supporting the Resources Profile, or a logical reference (e.g. using a urn:) - for instance, to a national published standard.

### 1.6.4: Control of extensions

As well as defining the base element structure for resources, HL7 also publishes extensions. HL7 publishes data definitions as extensions rather than as part of the base resource structure in order to keep the base resource structure simple and concise, and to allow implementers not to engage with an entire world's worth of functionality up front. Note that HL7 extensions are never flagged as must-understand - if HL7 publishes resource content that *must* be understood, it will be part of the resource content itself, since everyone has to understand the extension anyway.

Before extensions can be used in instances, they must be published. HL7 maintains two extension registries, and users are encouraged to register their extensions there. But this is not required; all that is required is that the extension is published in a context that is available for users of the extension. So, for example, if a particular extension is used exchanged within a single institution, the definition of the extension can be placed on the institution's intranet. However since, by their nature, resources tend to travel well, it's always better to use the HL7 extension registries.

HL7 provides two extension registries. The first is for HL7 approved extensions. These have been approved by an appropriate part of the HL7 community following a review process, and have formal standing. The other registry is provided as a service to the community, and anyone can register an extension on it.

|  |  |  |
| --- | --- | --- |
| **Registry** | **Search** | **Submit** |
| HL7 Approved | [TBD] | [TBD] |
| Community | [TBD] | [TBD] |
| Interim | <http://hl7connect.healthintersections.com.au/svc/fhir/profile/search> | <http://hl7connect.healthintersections.com.au/svc/fhir/profile/upload> |

HL7 profiles defining extensions may be balloted alongside resource content as part of the FHIR specification or may be published as part of separate specifications. When HL7 publishes extensions as part of the FHIR specification, these extensions SHALL be used for this data whenever the data is represented in instances. Applications SHOULD use other HL7-defined extensions published to represent equivalent data in the interest of maximum interoperability. If referencing a profile that defines extensions, implementations declaring conformance with the profile SHALL use the profile-defined and imported extensions when conveying equivalent data elements.

To minimize complexity for implementers, HL7 will not elevate content defined in an HL7-approved extension to be content defined in a core resource in future versions of the resource.

In some cases, an HL7 work group or other body may publish a profile whose sole purpose is to define extensions expected to be needed by implementers in a particular context. E.g. extensions needed to map a particular set of v2 segments or a v3 model.

Implementations are encouraged to share their extensions with HL7 and register them with the HL7 extension registry. The domain committees will work to elevate the extensions into HL7 published extensions or, if adopted by a broad enough portion of the implementer community, the into the base resource structure itself.

To avoid interoperability issues, extensions SHALL NOT change their definition once published. (Small clarifications to descriptions that do not affect interoperability are permitted.) Rather than modifying an existing extension, a new extension should be introduced. Revisions to an extension may extend the set of contexts in which the extension apply but may not remove or constrain any context previously listed

# 2: Implementation

**On This Page:**

[Reference Implementations](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.Use)

[Using SOA (§2.6.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.soa)

[Managing Identity (§2.6.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.identity)

[Icons (§2.6.7.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.icons)

## 2.6: Implementation Details

* [All schemas as a .zip](http://hl7.org/documentcenter/public/standards/FHIR/fhir-all-xsd.zip) (includes support schemas, resource schemas, modular & combined schemas, and Schematrons
* [Validation Pack](http://hl7.org/documentcenter/public/standards/FHIR/validation.zip) The FHIR validator (java jar), along with everything it needs to operate (including the correct version of Saxon)
* [Translation File](http://hl7.org/implement/standards/fhir/translations.xml) Translations of common FHIR names and messages into multiple languages (see [wiki (http://wiki.hl7.org/index.php?title=FHIR\_Implementation\_Page)](http://wiki.hl7.org/index.php?title=FHIR_Implementation_Page) for instructions on how to add to this)
* [Single combined feed with resource profiles](http://hl7.org/implement/standards/fhir/profiles-resources.xml). The resource profiles may be useful as a starting point for authoring profiles on the resources or with conformance statements
* [All resource examples as a zip file](http://hl7.org/documentcenter/public/standards/FHIR/examples.zip) ([JSON equivalent examples](http://hl7.org/documentcenter/public/standards/FHIR/examples-json.zip))

TODO: add RDF & OWL renditions, eCore definitions, ADL versions, anything anyone else asks for

#### 2.6.4.1: Reference Implementations

These reference implementations are provided for implementer interest and assistance. They may be used in production instances, though HL7 and its contributors accept no liability for this use. All these implementations are provided under a standard OSI approved BSD license (BSD-3-Clause).

These reference implementations are limited to code for representing the resource contents in their native form and parsing & serializing them as XML and JSON. In addition, some of the implementations provide support for building, using and reasoning with resource definitions. Full blown open source implementations for FHIR, some of which use these reference implementations, are listed on the [HL7 wiki (http://wiki.hl7.org/index.php?title=Open\_Source\_FHIR\_implementations)](http://wiki.hl7.org/index.php?title=Open_Source_FHIR_implementations) .

It is not necessary to use these particular implementations in order to be conformant. Any other approach may be used, including code generated from the schemas.

* [**Delphi**](http://hl7.org/documentcenter/public/standards/FHIR/delphi.zip): Resource Definitions and XML & JSON parsers. D5+. TODO: remove dependencies on unpublished code.
* [**Java**](http://hl7.org/documentcenter/public/standards/FHIR/java.zip): Resource Definitions, XML & Json parsers, validation & value set tooling. The java reference implementation depends on XmlPull (http://www.xmlpull.org/), the Java JSON library (http://json.org), the Apache Commons Codec library (http://commons.apache.org/codec/), and Saxon 9 (for validation).
* [**C#**](http://hl7.org/documentcenter/public/standards/FHIR/csharp.zip): Resource definitions, XML & Json parsers, validation and a FHIR Client API. The reference implementation uses the standard .NET framework and only Json.NET as a third-party assembly.
* [**ECore**](http://hl7.org/documentcenter/public/standards/FHIR/ecore.zip): Formal Object Definitions in OCLinECore text format - under development

### 2.6.5: Service Orientated use of Resources

While the FHIR Resources are designed with a simple [RESTful HTTP-based implementation](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) in mind, it is not necessary to use this implementation framework. This specification also defines a straight [messaging based implementation framework (§2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message) for FHIR resources and a [document-based framework (§2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document).

Alternatively, it is not necessary to use any of these approaches. Resources can be exchanged or persisted using any technical means that is appropriate to the context at hand. A common use of FHIR resources or [bundles (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) is as parameters of service interfaces. FHIR itself does not define any particular service interface. Instead, other standards and implementations define their own service interfaces and architecture that use FHIR resources and optionally build extra features on top of the base repository-mediated exchange that the FHIR RESTful specification provides. As long as the resources that are used are conformant with this specification and the rules for authoring and reading applications are followed, then the implementation can claim conformance to "FHIR Resources". Such implementations will need to resolve several issues:

* Resource identity (the "id" metadata property) must be maintained. Resources all have an identity, which is how other resources refer to them, and these references need to be able to be resolved. However resources are exchanged, their identity - which is not included inside the resource - needs to be included with the resource
* Resource references need to be resolvable. There are a variety of solutions to this, from ensuring that the all the relevant resources are bundled together or that all relevant resources are passed as parameters in a service call, through to having a resource repository in the background that provides access to all referenced resources.
* The [Resource metadata (§1.2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.metadata) items "Version Id" and "Last Modified Date" are provided for use in resolving resource versioning and concurrency issues, both from a technical and human perspective. Most contexts of use will require at least one if not both of these attributes for some uses, and the implementation framework will need to resolve how and when they are exchanged.
* The [conformance statement (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) allows authoring and reading applications to describe their rules concerning the use and contents of a resource. The implementation will need to describe how this conformance statement or some other equivalent fits into the exchange/persistence context.
* How transactional information such as data enterer, author(s), responsible party, consent and approvals is treated

The resolution to these issues should be documented and published with the service specification.

### 2.6.6: Managing Resource Identity

Each resource has a known identity. The identity is not stored inside the resource, but must be tracked by systems handling resources. For RESTful systems, the resource identity is the same as the URL by which it is found. When a resource is packaged in a [bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle), the id is included along with the resource. Real-world use of FHIR resources creates the need to manage resource identification.

Resources are used in a variety of circumstances. Generally, these can be categorized into 3 different scenarios:

1. **Closed Trading System**: the resources are only ever exchanged between fixed systems in a tightly controlled community, such as a hospital. There is only one master server for each resource type, and resources are managed by that server. In this context, the logical id of a resource is sufficient to fully identify the resource
2. **World-wide RESTful system**: there are many peer servers, each managing a set of resources of different types. In order to identify resources, a full URL reference to the origin server is required
3. **Partially closed, inter-linked systems**: a mixture of both - trading communities that are tightly managed, but have managed interactions with other closed trading systems, or with the world-wide RESTful system, or both. In fact, this combination appears to be the most likely scenario for current real-world healthcare business solutions

These combinations are why either relative (logical) or absolute references are allowed, and why a logical id is always required, in order to enable seamless exchange amongst partially closed trading systems.

#### 2.6.6.1: Copying Resources and re-identification

When resources are exchanged between systems, they may need to be re-identified (i.e. assigned a new resource). When a resource is re-identified, nothing in the resource changes, but any references that point to the resource need to be updated. Whether re-identification is required or not depends on the context, as does how resource references are updated.

The normal case is that a client/receiving system accepts the server/sender's identification of a resource at face value, whether it is a relative or absolute reference. When the client/receiver wants to follow resource references, they are done using the server id (typically either by http calls or locating them in a [bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle)). In such cases, there is no need for re-identification.

Another scenario is for a client to retrieve a resource from a server, and make its own local persistent copy. If the local resource has a life-cycle of its own (i.e. is it not just a cached resource), then it needs to have its own identity; i.e. the resource must be re-identified. The simplest case is that the client only is keeping local copies of resources from a single server. In these cases, the client can simply replace the root URL and keep the logical id of the resource the same. In fact, if the server is using relative references, then this change doesn't involve any actual changes to the resources, only a re-interpretation of the references.

In some cases, however, the client may deal with multiple servers. In this case, the logical id of the resource is not guaranteed to be unique (unless all resources have a UUID for the logical id, which is allowed but not required). When the client cannot be sure that the resource identities are unique, it will have to re-identify the resources. In practice this means that the client needs to keep an identity translation table, and update references to the resources it has copied locally when other resources are received.

The case of a gateway system that migrates resources from one eco-system to another is very similar. In some limited cases, it can leave the logical id of the resources unchanged as resources are copied from one closed system to another. However in more complicated cases, it will have to modify the resource references as resources pass across the gateway.

### 2.6.7: Workflow with resources

There are many ways to implement any particular workflow and there are many ways to use resources to build working systems:

* A RESTful paradigm where resources are exchanged separately using http transactions directly as defined in this specification. Implementations can use both push and pull or a mix of the two
* The resources can be exchanged in messages or some other SOA implementation where the resources form the contents/parameters that are exchanged
* The resources can be "bundled" into documents that are self-contained and complete collections of linked resources and then these documents can be exchanged and/or persisted
* The resources can be embedded in HTML pages or other web content such as content feeds

#### 2.6.7.1: Icons

Any (conformant?) FHIR Implementation is allowed to use the FHIR icon in association with the FHIR implementation. The FHIR icon is available in various sizes:

**On This Page:**

[General Issues](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.root)

[operations (§2.1.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.read)

[Tag Operations (§2.1.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.tags)

[Binary Support (§2.1.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.binary)

[hData Information (§2.1.20)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.hdata)

[Paging (§2.1.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.paging)

[Summary (§2.1.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.summary)

## 2.1: RESTful HTTP Details

In addition to the set of base resources, FHIR also provides a simple RESTful implementation using [HTTP (http://www.w3.org/Protocols/rfc2616/rfc2616.html)](http://www.w3.org/Protocols/rfc2616/rfc2616.html) . Each resource type has the same set of interactions defined that can be used to manage the resources in a highly granular fashion. Applications claiming conformance to this framework claim to be conformant to "RESTful FHIR".

Note that in this RESTful framework, transactions are performed directly on the server resource using an HTTP request/response. The API does not directly address authentication, authorization, and audit collection - for further information, see the [Security Page (§2.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#security).

The API describes the FHIR resources as a set of operations on resources where individual resource instances are managed in collections by their type. Servers can choose which of these operations are made available and which resource types they support. Servers SHALL provide a [conformance statement (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) that specifies what interactions and resources are supported.

The following logical interactions are defined:

|  |  |
| --- | --- |
| **Instance Level Operations** |  |
| [read (§2.1.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.read) | Read the current state of the resource |
| [vread (§2.1.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.vread) | Read the state of a specific version of the resource |
| [update (§2.1.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.update) | Update an existing resource by its id (or create it if it is new) |
| [delete (§2.1.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.delete) | Delete a resource |
| [history (§2.1.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.history) | Retrieve the update history for a particular resource |
| **Type Level Operations** | |
| [create (§2.1.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.create) | Create a new resource with a server assigned id |
| [search (§2.1.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.search) | Search the resource type based on some filter criteria |
| [history (§2.1.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.history) | Retrieve the update history for a particular resource type |
| [validate (§2.1.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.validate) | Check that the content would be acceptable as an update |
| **Whole System Operations** | |
| [conformance (§2.1.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.conformance) | Get a conformance statement for the system |
| [transaction (§2.1.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.transaction) | Update, create or delete a set of resources as a single transaction |
| [history (§2.1.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.history) | Retrieve the update history for all resources |

### 2.1.1: Service Root URL

The Service Root URL is the address where all of the resources defined by this interface are found. The Service Root URL takes the form of

http(s)://server[/path]

The optional path may end with a trailing slash or not. Each resource type defined in this specification has a manager (or "entity set") that lives at the address "/[name]" where the name is the name of the resource type in lower case. For instance, the resource manager for the type "Patient" will live at:

http://server/path/patient

All the logical operations are defined relative to this service root URL. Note that this means that given the address of any one FHIR resource on a system, the correct address for all the other resources may be determined. However since application URLs may change and because in some uses of FHIR within internal eco-systems, local configuration may dictate that the provider of a resource is different to that claimed by any particular provider or consumer, applications may need to replace Service Root URLs.

Note: All URLs (and ids that form part of the URL) defined by this specification are case sensitive.

Note that a server may use a path of the form http://server/...[id]... where the id is some variable portion that identifies a particular instantiation of the FHIR API. Typically, the variable id identifies a patient, and the underlying information is completely compartmented by the patient id. In this case, the FHIR API presents a patient centric view of the record, where authentication/authorization is explicitly granted to the id contained in the URL.

### 2.1.2: Resource Metadata and Versioning

Each resource has an associated set of [resource metadata elements (§1.2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.metadata). These map to the http request and response using the following fields:

|  |  |
| --- | --- |
| **Metadata Item** | **HTTP Response Header** |
| Id | The Id is represented explicitly in the URL |
| Version Id | The Version Id is represented by the full canonical URL in the content-location header (see [vread (§2.1.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.vread) below). The Version Id may also be represented in the http ETag, but the use of ETag is not needed by this specification |
| Last Modified Date | HTTP Last-Modified header |

### 2.1.3: Security

See [HTTP Security (§2.6.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#security.http).

### 2.1.4: HTTP Status Codes

This specification makes rules about the use of specific HTTP status codes in particular circumstances where the status codes must map to particular states correctly, and only where the correct status code is not obvious. Other HTTP status codes may be used for other states as appropriate, and this particularly includes various authentication related status codes and redirects. Authentication redirects should not be interpreted to change the location of the resource itself (a common web programming error).

FHIR defines an [OperationOutcome resource (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) that can be used to convey specific detailed processable error information. For a few combinations of operations and specific return codes, an OperationOutcome is required to be returned as the content of the response. The OperationOutcome may be returned with any HTTP 4xx or 5xx response, but is not required - many of these errors may be generated by generic server frameworks underlying a FHIR server.

### 2.1.5: Content Types and encodings

The formal MIME-type for FHIR resources is application/fhir+xml (still to be registered) and SHOULD be use by clients and servers. Servers must support server-driven content negotiation as described in [section 12 (http://www.w3.org/Protocols/rfc2616/rfc2616-sec12.html#sec12)](http://www.w3.org/Protocols/rfc2616/rfc2616-sec12.html#sec12) of the HTTP specification, but in order to support various implementation limitations, may choose to support the (?\_format=) parameter to specify alternative response formats by their MIME-types. For the \_format parameter, the values "xml", "text/xml" and "application/fhir+xml" must be interpreted to mean the normative XML format defined by FHIR and "json", "application/json" and "application/fhir+json" must be interpreted to mean the informative JSON format. The applicable content type also depends on whether a bundle or single resource is communicated:

|  |  |  |
| --- | --- | --- |
|  | **xml** | **json** |
| Resource | application/fhir+xml | application/fhir+json |
| Bundle | application/atom+xml | application/fhir+json |

FHIR uses UTF-8 for all request and response bodies. Since the HTTP specification (section 3.7.1) defines a default character encoding of ISO-8859-1, requests and responses MUST explicitly set the character encoding to UTF-8 using the 'charset' parameter of the MIME-type in the Content-Type header. Requests MAY also specify this charset parameter in the Accept header and/or use the Accept-Charset header.

### 2.1.6: read

The read interaction accesses the current contents of a resource. The interaction is performed by an HTTP GET operation as shown:

GET [service-url]/[resourcetype]/{@id} (?\_format=mimeType)

This returns a single instance with the content specified for the resource type. This url may be accessed by a browser. The logical id is preceded by a "@" to make parsing the url easier. The possible values for the id itself are described in the [id type](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id). Servers are required to return a content-location header with the response which is the full version specific url (see vread below) and a Last-Modified header.

Note: Unknown resources and deleted resources are treated differently on a read: A GET for a deleted resource returns a 410 status code, whereas a GET for an unknown resource returns 404. Systems that do not track deleted records will treat deleted records as an unknown resource.

### 2.1.7: vread

The vread interaction preforms a version specific read of the resource. The interaction is performed by an HTTP GET operation as shown:

GET [service-url]/[resourcetype]/{@id}/history/{@vid} (?\_format=mimeType)

This returns a single instance with the content specified for the resource type for that version of the resource.

The version id is an opaque identifier that conforms to the same format requirements as a resource id. The id may have been found by performing a history operation (see below), by recording the version id from a content location returned from a read or from a version specific reference in a content model. If the version referred to is actually one where the resource was deleted, the server should return a 410 status code.

Servers are encouraged to support a version specific retrieval of the current version of the resource even if they are do not provide access to previous versions. If a request is made for a previous version of a resource, and the server does not support accessing previous versions, it should return a 405 Method Not Allowed error.

### 2.1.8: update

The update interaction creates a new current version for an existing resource or creates a new resource if no resource already exists for the given id. The update interaction is performed by an HTTP PUT operation as shown:

PUT [service-url]/[resourcetype]/{@id} (?\_format=mimeType)

If the operation is successful, the server must return either a 200 OK if the resource was updated, or a 201 Created if the resource was created, along with a copy of the newly updated resource (which might not be the same as that submitted) with the response, along with a Last-Modified header, and a Location and Content-Location header that refers to the specific version created by the updated operation.

Servers are permitted to reject update operations because of integrity concerns or business rules implemented on the server, and return HTTP status codes accordingly (usually 422).

In particular, servers may choose to implement version-aware updates, where the only updates that are accepted quote the current version of the resource. In this case, the client must submit the currently correct version specific URL in the Content-Location in the PUT request. If the value is missing, the server SHALL return a 412 Preconditions failed response. Clients SHOULD submit a proper Content-Location header and SHALL correctly understand a 409 response as an update conflict.

Common HTTP Status codes returned on FHIR-related errors (in addition to normal HTTP errors related to security, header and content type negotiation issues):

* **400 Bad Request** - resource could not be parsed or failed basic FHIR validation rules
* **404 Not Found** - resource type not supported, or not a FHIR end point
* **405 Method Not allowed** - the resource did not exist prior to the update, and the serer does not allow client defined ids
* **409/412** - version conflict management - see above
* **422 Unprocessable Entity** - the proposed resource violated applicable FHIR profiles or server business rules. This should be accompanied by an [Issue (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) resource providing additional detail

### 2.1.9: delete

The delete interaction removes an existing resource. The interaction is performed by an HTTP DELETE operation as shown:

DELETE [service-url]/[resourcetype]/{@id}

A delete operation means that [non-version specific reads (§2.1.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.read) of a resource return a 410 error and that the resource is no longer found through search operations. Upon successful deletion the server should return 204 (No Content). If the server refuses to delete resources of that type on principle, then it should return the status code 405 method not allowed. If the server refuses to delete a resource because of reasons specific to that resource, such as referential integrity, it should return the status code 409 Conflict. If the resource cannot be deleted because it does not exist on the server, the server must return 404 (Not found). Performing this operation on a resource that is already deleted has no effect, and should return 204. Resources may be undeleted by PUTting an update to them subsequent to the deletion.

Many resources have a status element that overlaps with the idea of deletion. Each resource type defines what the semantics of the deletion operations are. If no documentation is provided, the deletion operation should be understood as deleting the record of the resource, with nothing about the state of the real-world corresponding resource implied.

### 2.1.10: create

The create interaction creates a new resource in a server assigned location. If the client wishes to have control over the id of a newly submitted resource, it should use the update operation instead. The create interaction is performed by an HTTP POST operation as shown:

POST [service-url]/[resourcetype] (?\_format=mimeType)

The server returns a 201 Created, along with a copy of the newly created resource (which might not be the same as that submitted) with the acknowledgement, along with a version-aware Location header which contains the new location and id of the created resource:

Location: [service-url]/[resourcetype]/{@new-id}/history/{@new-vid}

When the payload data is incorrect and cannot be used to create a new resource, the server returns a 400 Bad Request.

Common HTTP Status codes returned on FHIR-related errors (in addition to normal HTTP errors related to security, header and content type negotiation issues):

* **400 Bad Request** - resource could not be parsed or failed basic FHIR validation rules
* **404 Not Found** - resource type not supported, or not a FHIR end point
* **422 Unprocessable Entity** - the proposed resource violated applicable FHIR profiles or server business rules. This should be accompanied by an [Issue (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) resource providing additional detail

### 2.1.11: search

This interaction searches a set of resources based on some filter criteria. The interaction can be performed by several different HTTP operations. To search all resources at once:

GET [service-url]/?parameters (&\_format=mimeType)

To search a single resource type:

GET [service-url]/[resourcetype]/(?parameters) (&\_format=mimeType)

GET [service-url]/[resourcetype]/search(?parameters) (&\_format=mimeType)

To search a [compartment (§1.2.2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.compartments):

GET [service-url]/[compartment]/@[id]/\*?parameters (&\_format=mimeType)

GET [service-url]/[compartment]/@[id]/[resourcetype]?parameters (&\_format=mimeType)

Because of the way that some user agents treat GET and POST requests, POST submissions are also allowed with exactly the same semantics as the equivalent GET operation. All these search operations take a series of parameters that are a series of name'='value pairs encoded in the URL (or as an x-multi-part-form submission for a POST). (See [W3C HTML forms (http://www.w3.org/TR/REC-html40/interact/forms.html#form-content-type)](http://www.w3.org/TR/REC-html40/interact/forms.html#form-content-type) ). Searches are processed as specified for the [Query handling mechanism (§2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query).

The return content is an [Bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) containing the results of the search as a list of resources in a defined order. Searches SHOULD use paging as described [below (§2.1.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.paging).

### 2.1.12: validate

The validate interaction checks whether the attached content would be acceptable as an update to an existing resource. The validation operation may be the first part of a light two- phase commit process. The interaction is performed by an HTTP POST operation as shown:

POST [service-url]/[resourcetype]/validate/{@id}

The content is first checked against the general specification and against the conformance profile that applies to the application. How much additional checking over the normal create and update operations is performed is at the discretion of the server. Then the resource is considered as a proposed update and additional instance specific rules such as referential integrity and update logic (including version control) are applied as well. The return content has one of the following values:

* **400 Bad Request** - resource could not be parsed or had some basic FHIR validation error
* **200 OK** - resource passed all validation rules
* **422 Unprocessable Entity** - the resource was valid, but it violates applicable FHIR profiles or server business rules

Unless the result is 200 OK, the response must include an [Issue Report (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) that lists the issues found on validation.

The validation operation has complex semantics and rules; see the full discussion of the operation in the [OMG hData REST specification (§2.1.20)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.hdata) for further details.

### 2.1.13: conformance

The conformance interaction retrieves the application's conformance statement that defines how it supports resources. The interaction is performed by an HTTP OPTIONS or a GET operation as shown:

GET [service-url]/metadata (?\_format=mimeType)

OPTIONS [service-url] (?\_format=mimeType)

Applications SHALL return a [Conformance Resource (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) that specifies which resource types and operations are supported for the GET operation, and SHOULD do so for the OPTIONS operation. If a 404 Unknown is returned from the GET, FHIR is not supported on the nominated service url. The GET operation is defined because not all client libraries are able to perform an OPTIONS operation. Additional parameters that are required to be returned with the OPTIONS command are defined in the [OMG hData RESTful Transport (§2.1.20)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.hdata) specification.

Note that Servers may choose what content to return when they receive a GET operation on the Service Root URL. Generally some page that guides human manual interaction with the server would be appropriate.

A server may also choose to provide the standard set of operations on the [Conformance Resource (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance), which means that it stores and manages a set of conformance statements. These managed conformance statements should not be confused with the server's own conformance statement, which is what is returned from these methods.

### 2.1.14: transaction

The transaction interaction submits a set of resources to be updated, created or deleted on the server. This interaction allows multiple resources to be updated/created in a single transaction. Multiple different types of resources may be submitted, including a mix of new and existing resources. The interaction is performed by an HTTP POST operation as shown:

POST [service-url] (?\_format=mimeType)

The content of the post submission is a resource bundle. The resources in the bundle are each processed separately as if they were an individual [create (§2.1.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.create), [update (§2.1.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.update) or [delete (§2.1.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.delete) as described below, along with the normal processing for each (such as tracking tags, verification and version aware updates). Servers SHALL either accept all resources and return a 200 OK, along with a response bundle, or reject all resources and return an HTTP 400 or 500 type response. It is not an error if the submitted bundle has no resources in it. The outcome of the processing the transaction SHALL not depend on the order of the resources in the transaction. Note that this means that a resource can only appear in a transaction once, and since bundles may have the same resource more than once or other order dependencies (e.g. update lists), some kinds of bundles may not be able to be used in a transaction.

When a bundle is submitted in a transaction operation, all the resources have an identity specified in the bundle. If the identity of the resource matches an existing or possible resource location on the server, the server should treat this entry as an [update operation (§2.1.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.update) (i.e. PUT to the given resource). If the identity is not one that the server recognises as a resource location it can use, the server should treat the operation as a [create operation (§2.1.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.create) (i.e. POST to the given resource type URL), and create a new identity for the submitted resource. For clarity, when the client intends a resource to have a transient identity that the server must replace, it should use a cid: url on the resource. Note that the client must provide an identity in the bundle entry.id, but may also provide a version specific identity the atom "self" link, and may refer to this for version specific references. Deleted resources are those marked clearly using the method described for [XML](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.atom-deleted) or [JSON](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.json-bundle-delete).

A transaction may include references from one resource to another in the bundle, which may include circular references where resources refer to each other. If the server assigns a new identity to any resource in the bundle, it SHALL also update any references to that resource in the same bundle as they are processed. References to resources that are not part of the bundle are left untouched. If a resource in the bundle carries a version-specific id (using its self-link), any version-specific references to it must also be updated. Servers SHALL be replace all matching links in the bundle, whether they are found in the resource ids, resource references, url elements, or <a href="" & <img src="" in the narrative.

Note that this allows clients to assign temporary (version-specific) ids to new resources and refer to them from within the bundle while the server will update these temporary ids after their creation. This is especially useful in RESTful scenario's where one would otherwise need multiple operations, possibly leading to loss of referential integrity (e.g. when storing a Provenance resource and its corresponding target resource), or, on document repositories, a document index entry and its accompanying document.

In order to allow the client to know how newly created resources are now identified for future reference, the server must return a bundle containing the results of processing the resources in the same order that they were submitted.

The application constructing a bundle may not be sure whether a particular resource will already exist at the time that the transaction is executed; this is typically the case with reference resources such as patient and provider. In this case, the bundle should contain a candidate resource with a cid: identifier, and an additional search specifier using an Atom link:

<link href="http://localhost/patient/search?[parameters]" rel="search"/>

A search link with a root of http://localhost means to search the local resource store for a match as specified in the parameters (which must conform to the servers capability for searching as specified in its conformance statement). If the search returns no matches, the server process the resource normally. If the search returns one match, the server uses this matching resource instead, and ignores the submitted resource. If more than one resource is found, the transaction must be rejected.

If the server that is processing the transaction requires version aware updates, the client may need to reference what is the server's current version of the resource, which is now the client's previous version:

<link href="[url]/patient/@34/history/@31" rel="predecessor-version"/>

The predecessor-version is treated as if it were the content-location header on an update operation.

### 2.1.15: history

The history interaction retrieves the history of either a particular resource, all resources of a given type, or all resources supported by the system. These three variations of the history operation are performed by HTTP Get operation as shown:

GET [service-url]/[resourcetype]/{@id}/history (?\_format=mimeType)

GET [service-url]/[resourcetype]/history (?\_format=mimeType)

GET [service-url]/history (?\_format=mimeType)

The return content is a [Bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) containing the specified version history, sorted with oldest versions last, and including deleted resources.

|  |  |  |
| --- | --- | --- |
| \_count : [integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer) | *single* | Number of return records requested. The server is not bound to return the number requested, but cannot return more |
| \_since : [instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer) | *single* | Only include resource versions that were created at or after the given instant in time |

The history list can be restricted to a limited period by specifying a \_since parameter which contains a full date time with timezone. Servers must ensure that if a client uses the feed.updated date from the last response they received as the value of the \_since parameter, no versions will be missed. Clients should be aware that due to timing imprecision, they may receive notifications of a resource update on the boundary instant more than once. Servers are not required to support a precision finer than by second.

The updates list can be long, so servers SHALL use the method described in [RFC 5005 (Feed Paging and Archiving) (https://tools.ietf.org/html/rfc5005)](https://tools.ietf.org/html/rfc5005) (also [see above (§2.1.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.paging)) for breaking the updates list into pages if appropriate.

The history operation is suitable for use with internet pub/sub systems based on rss/atom, including services such as Google Reader, allowing humans to easily subscribe to notifications of updates to a resource (this is usually appropriate for low volume high knowledge resources like profiles). In addition, the history operation can be used to set up a subscription from one system to another, so that resources are synchronised between them. Systems receiving such feeds and planning on enforcing resource integrity should note that [transaction (§2.1.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.transaction) boundaries are not reflected in the history list.

Searches SHOULD use paging as described [below (§2.1.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.paging)

### 2.1.16: Tag Operations

[Tags (§1.2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.tags) are attached to resources to define operational behaviour. When resources are exchanged directly use HTTP on the read, vread, create and update operations, the http header "Category" is used, following the method described for [Web Categories (http://tools.ietf.org/html/draft-johnston-http-category-header-02)](http://tools.ietf.org/html/draft-johnston-http-category-header-02) .

Category: [Tag URI]; scheme="http://hl7.org/fhir/tag"; label="[Tag label]"(, ...)

The label portion is optional. Note that label may come before scheme. Although Category is described as a repeating header, many implementations require unique header names, so multiple tags are representing using the one header.

|  |  |
| --- | --- |
| read/vread | The server returns all tags associated with the resource in the headers |
| create | The server stores all the tags provided in the headers |
| update | The server stores all the tags provided in the headers, and keeps any tags already associated with the resource |

In the other operations, the resources are wrapped in bundles, where tags are represented in the *entry.category* element and servers populate these completely or process these as part of a transaction submission.

The following operations provide specific support for Tags:

|  |  |
| --- | --- |
| GET [service-url]/tags | get a list of all tags |
| GET [service-url]/[type]/tags | get a list of all tags used for the nominated resource type |
| GET [service-url]/[type]/@[id]/tags | get a list of all tags affixed to the nominated resource. This duplicates the HTTP header entries |
| GET [service-url]/[type]/@[id]/history/@[vid]/tags | get a list of all tags affixed to the nominated version of the resource. This duplicates the HTTP header entries |
| POST service-url]/[type]/@[id]/tags | Affix tags in the list to the nominated resource |
| POST service-url]/[type]/@[id]/history/@[vid]/tags | Affix tags in the list to the nominated version of the resource |
| DELETE service-url]/[type]/@[id]/tags | Remove tags in the list affixed to the nominated resource |
| DELETE service-url]/[type]/@[id]/history/@[vid]/tags | Remove tags in the list to the nominated version of the resource |

The tags of an old version can still be changed. Note that changing the tags on a resource does not create a new version of the resource. A tag list is represented like this in XML and JSON:

<taglist xmlns="http://hl7.org/fhir">

<!-- Tags in the list (**0..\***): -->

<category term="[Tag Uri]" label="[Tag Label]" scheme="http://hl7.org/fhir/tag">

</taglist>

{

"taglist" : {

"category" : [{

"term" : "[Tag Uri]",

"label" : "[Tag Label]",

"scheme" : "http://hl7.org/fhir/tag"

}]

}

}

### 2.1.17: Binary Support

FHIR servers can choose to offer support for purely binary resources at the end point [service-url]/binary. The binary end-point accepts any kind of content, such as images and other media, documents (CDA, PDF, Word etc.), plain text, XML or anything else, and stores the content as is, along with the content type provided by the HTTP headers.

Binary resources function with the same operations as described above, except that there is no support for the search operation. The \_format parameter has no meaning when used with binary resources: they are always represented using their original content type.

### 2.1.18: Paging

Servers SHOULD conform to the method described in [RFC 5005 (Feed Paging and Archiving) (https://tools.ietf.org/html/rfc5005)](https://tools.ietf.org/html/rfc5005) for sending continuation links to the client when returning a bundle (e.g. with history and search). If the server does not do this, there is no way to continue paging.

This example shows the third page of a search result:

<feed xmlns="http://www.w3.org/2005/Atom">

<title>Search Page 3</title>

<!-- This Search. url starts with base search, and adds the effective

parameters, and additional parameters for search state. All searches SHALL return this value.

In this case, the search continuation method is that the server maintains a state, with page

references into the stateful list.

-->

<link rel="self" href="http://example.org/patient/search?name=peter&stateid=23423443&page=3"/>

<!-- 4 links for navigation in the search. All of these are optional, but recommended -->

<link rel="first" href="http://example.org/patient/search?name=peter&stateid=23423443&page=1"/>

<link rel="previous" href="http://example.org/patient/search?name=peter&stateid=23423443&page=2"/>

<link rel="next" href="http://example.org/patient/search?name=peter&stateid=23423443&page=4"/>

<link rel="last" href="http://example.org/patient/search?name=peter&stateid=23423443&page=26"/>

<updated>2003-12-13T18:30:02Z</updated>

<!-- the rest of the search results... -->

</feed>

The server need not use a stateful paging method as shown in this example - it is at the discretion of the server how to best ensure that the continuation retains integrity in the context of ongoing changes to the resources. An alternative approach is to use version specific references to the records on the boundaries, but this is subject to continuity failures when records are updated.

A server MAY inform the client of the total number of resources returned by the operation using the *totalResults* element from the [OpenSearch specification (http://www.opensearch.org/Specifications/OpenSearch/1.1)](http://www.opensearch.org/Specifications/OpenSearch/1.1) :

<feed xmlns="http://www.w3.org/2005/Atom">

<title>Search Page 3</title>

<os:totalResults xmlns:os="http://a9.com/-/spec/opensearch/1.1/">1432</os:totalResults>

<!-- the rest of the search results... -->

</feed>

Note that for search, where \_include can be used to return additional related resources, the total number of resources in the feed may exceed the number indicated in totalResults.

### 2.1.19: Intermediaries

The HTTP protocol may be routed through an HTTP proxy such as squid. Such proxies are transparent to the applications, though implementers should be alert to the effects of caching, particularly including the risk of receiving stale content. See the [HTTP specification (http://tools.ietf.org/html/rfc2616#page-74)](http://tools.ietf.org/html/rfc2616#page-74) for further detail

Interface engines may also be placed between the consumer and the provider. These differ from proxies because they actively alter the content and/or destination of the HTTP exchange and are not bound the rules that apply to HTTP proxies. Such agents are allowed, but must mark the http header to assist with troubleshooting.

Any agent that modifies an HTTP request or Response content other than under the rules for HTTP proxies must add a stamp to the HTTP headers like this:

request-modified-[identity]: [purpose]

response-modified-[identity]: [purpose]

The identity must be a single token defined by the administrator of the agent that will sufficiently identify the agent in the context of use. The header must specify the agent's purpose in modifying the content. End point systems must not use this header for any purpose. Its aim is to assist with system troubleshooting.

### 2.1.20: OMG hData RESTful Transport

This RESTful specification described here is based on the [OMG Health RESTful specification (http://www.omg.org)](http://www.omg.org/) (specific reference to be provided when this is published). In this regard, FHIR functions as a Record Format Profile as described in that specification. Note the following significant factors to be aware of:

* FHIR maps the hData sections to resource types, and hData documents to resource instances. There are no subsections, and client systems are not able to create new sections
* The FHIR resource id maps to the hData document name by prepending "@"
* Because clients cannot submit new sections (POST to service URL), POST to the service URL has been re-used for [the transaction operation (§2.1.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.transaction) (difference under review)
* FHIR does not (yet) define a root document. When defined, it will contain information about what the FHIR server has done (as opposed to a conformance statement, which describes what it is capable of doing)
* Note that this specification does not repeat the rules in the hData RESTful Transport concerning the OPTIONS command on the service URL, but these rules (extra headers etc.) still apply

### 2.1.21: Summary

These tables present a summary of the operations described here.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Operation** | **Path** | **Request** | | | | |
|  | | **Verb** | **Content-Type** | **Body** | **Accept** | **Content-Location** |
| read | /[type]/@[id] | GET | N/A | N/A | O | N/A |
| vread | /[type]/@[id]/history/@[vid] | GET | N/A | N/A | O | N/A |
| conformance | / or /metadata | OPTIONS / GET | N/A | N/A | O | N/A |
| update | /[type]/@[id] | PUT | R | Resource | O | O or R |
| create | /[type] | POST | R | Resource | O | N/A |
| transaction | / | POST | R | Bundle | O | N/A |
| delete | /[type]/@[id] | DELETE | N/A | N/A | N/A | N/A |
| search | /[type]/search | GET | N/A | N/A | O | N/A |
| search-all | /[type] | GET | N/A | N/A | O | N/A |
| validate | /[type]/validate/@[id] | POST | R | Resource | O | N/A |
| history | /[type]/@[id]/history | GET | N/A | N/A | O | N/A |
| history-type | /[type]/history | GET | N/A | N/A | O | N/A |
| history-all | /history | GET | N/A | N/A | O | N/A |

Note: N/A = not present, R = Required, O = optional.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Operation** | **Response** | | | | |
|  | **Content-Type** | **Body** | **Location** | **Content-Location** | **Status Codes** |
| read | R | Resource | N/A | R | 200, 404, 410 |
| vread | R | Resource | N/A | O | 200, 404, 405, 410 |
| conformance | R | Conformance | N/A | O | 200, 404 |
| update | R | Resource | N/A | R | 201, 400, 404, 405, 409, 412, 422 |
| create | R | Resource | R | O | 200, 201, 400, 404, 405, 422 |
| transaction | R | Bundle | N/A | N/A | 200, 400, 404, 405, 409, 412, 422 |
| delete | N/A | N/A | N/A | N/A | 204, 405, 404 |
| search | R | Bundle | N/A | N/A | 200 |
| search-all | R | Bundle | N/A | N/A | 200 |
| validate | N/A or R | N/A or OperationOutcome | N/A | N/A | 400 |
| history | R | Bundle | N/A | N/A | 200 |
| history-type | R | Bundle | N/A | N/A | 200 |
| history-all | R | Bundle | N/A | N/A | 200 |

Note: this table lists the status codes described here, but other status codes are possible as described by the HTTP specification. Additional codes that are likely a server errors and various codes associated with authentication protocols.

## 2.2: Resource Definition: Query

A description of a query with a set of parameters.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /query/

**On This Page:**

[Search/Query (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base)

[Standard Parameters (§2.2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.standard)

[Managing Returned Resources (§2.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.return)

[Conformance (§2.2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.conformance)

[Advanced Query (§2.2.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.advanced)

[Query Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.query)

[Managing Search Results (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.results)

### 2.2.1: Search / Query

One operation that is fundamental to the way FHIR works is to search (find existing resources by filter criteria) or query (more detailed questions based on existing data). Search/query operations can span complexity from a simple search based on indexed criteria, through to complex decision support based requests, and finally complex queries that can only be resolved by human intervention. This page documents the FHIR search framework, starting with the simple cases, and working through to the full complexity. Implementations need only implement the amount of complexity that they require.

In the simplest case, a search is executed by performing a GET operation in the RESTful framework:

GET .../[resourcetype]/(?parameters)

For this RESTful search, the parameters are a series of name=value pairs encoded in the URL or as an x-multi-part-form submission for a POST. The server returns the results in the HTTP response as a bundle (in XML, an atom feed) which includes the resources that are the results of the query. The server can also include additional resources in the result set, such as [OperationOutcome (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) resources. Clients should ignore resources that don't have the expected type. A HTTP status code of 403 signifies that the server refused to perform the query, while some other 4xx or 5xx code signifies that some error occurred.

Search operations are executed in one of 3 defined contexts that control which set of resources are being searched:

* A specified resource type
* A specified [compartment (§1.2.2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.compartments), perhaps with a specified resource type in that compartment
* All resources

Search/Query operations can also be initiated by other more complex and flexible methods described below, which change both the way the search/query is initiated, and the results are returned.

### 2.2.2: Standard Parameters

The search parameter \_id refers to the logical id of the resource, and can be used when the search context specifies a resource type:

GET .../patient?\_id=23

This search finds the patient resource with the given id (there can only be one resource for a given id). Functionally, this is equivalent to a [simple read operation (§2.1.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.read):

GET .../patient/@23

except that it returns a bundle with the requested resource, rather than the resource itself. However additional parameters can be added which may provide additional functionality on top of this base read equivalence.

In addition to this resource, each FHIR resource type defines a set of applicable search parameters with their names, types, and meanings. Mostly, the defined search parameters correspond to a single element in the resource, but this is not required, and some search parameters refer to the same type of element in multiple places, or refer to derived values.

Servers are not required to implement any of these search parameters (except for the \_id parameter described above), and may define their own additional parameters if they wish.

#### 2.2.2.1: Search Parameter Types

Each search parameter is defined a type that defines how the search parameter behaves. These are the defined parameter types:

|  |  |
| --- | --- |
| integer | Search parameter must be a simple whole number |
| string | Search parameter is a simple string, like a name part. Search is case-insensitive and accent-insensitive. May match just the start of a string. String parameters may contain spaces and are delineated by double quotes, e.g. "van Zanten". |
| text | Search parameter is on a long string. Used for text filter type search: it functions on searches within a body of text and may contain spaces to separate words. May match even if the separate words are found out of order. Text parameters are delineated by double quotes. |
| date | Search parameter is on a date (and should support :before and :after modifiers). The date format is the standard XML format, though other formats may be supported |
| token | Search parameter on a coded element or identifier. May be used to search through the text, displayname, code and code/codesystem (for codes) and label, system and key (for identifier). Its value is either a string or a pair of namespace and value, separated by a "!". |
| reference | A pair of resource type and resource id, separated by "/". Matches when the resource reference resolves to a resource of the given type and id. |
| composite | A composite search parameter that combines other search parameters together |

The search parameters can also have "modifiers" appended to them that control their behaviour. The kind of modifiers that can be used depend on the type of parameter.

##### Modifiers

Parameters are defined per resource, and their names may additionally specify a modifier as a suffix, separated from the parameter name by a dot. Modifiers are:

* For all parameters (*except combination*): "missing". E.g. gender:missing=true (or false). Searching for "gender:missing=true" will return all the resources that don't have any value for the gender parameter (which usually equates to not having the relevant element in the resource). Searching for "gender:missing=false" will return all the resources that have a value for the "gender" parameter.
* For dates: ":before" and ":after". E.g. birthdate:before=1972-11-30. See below for how date searches are interpreted.
* For string: ":exact" (the match needs to be exact, no partial matches, case sensitive and accent-sensitive) and ":partial" (the search may function on partial matches). It is at the discretion of the server whether to do a left-partial search
* For token: ":text" (the match does a partial searches on the text portion of a CodeableConcept or the display portion of a Coding), ":code" (a match on code and system of the coding/codeable concept).

##### integer

The prefixes >, >=, =<, and < may be used on the parameter value, and has the usual meaning. Note that '=" must be escaped in the value in a URL.

##### token

A token type is a parameter that searches on a code or identifier value where the value may have a URI that scopes its meaning (from a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) or an [Identifier (§1.4.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) type, and also from a [code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code) where the URI is implicit).

If the parameter has no modifier, or the modifier ":text", the search parameter is a string, if the modifier is ":code" the parameter is a pair of fixed value strings, namespace and value, separated by a "!". Without modifier, the search will use the textual parameter to do a partial match on code, text or display. With modifier ":text" the search will do a partial match on text or display. With the ":code" modifier, the search will work as follows:

* **name=namespace!code** specifies matches on both the namespace and the code (or, for identifiers, key)
* **name=!code** matches a code that has no specified namespace
* **name=code** matches all codes irrespective of the namespace

In the url of the code system, the “#” (fragment identifier) must be escaped, and in some implementations, the ":" does too.

As an example, the following search:

GET [base-url]/patient?identifier=http://acme.org/patient!2345

searches for all the patients with an identifier with key = "2345" in the system "http://acme.org/patient".

##### date

A date parameter searches on a date/time or period. As is usual for date/time related functionality, while the concepts are relatively straight-forward, there are a number of subtleties involved in ensuring consistent behavior.

* The date parameter format is yyyy-mm-ddThh:nn:ss(TZ) (the standard XML format).
  + Technically, this is any of the [date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date), [dateTime (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.datetTime), and [instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant) data types
  + e.g. Any degree of precision can be provided, but it must be populated from the left (e.g. can't specify a month without a year), except that the minutes SHALL be present if an hour is present, and you SHOULD provide a timezone if the time part is present
  + Some user agents may escape the ":" characters in the URL, and servers SHALL handle this correctly
* Date parameters have the :before and :after modifiers. [date]=[value] searches for where the date is within the given date value. [date]:after=[value] searches for all resources where the specified date is after [value]. [date]:before=[value] searches for all resources where the specified date is before [value].
* The element the search refers to may be a date, a dateTime, a Period, or a Schedule. All of these time related types actually specify an interval of time, as does the search parameter itself.
  + For Period and Schedule, the interval of time is explicit (though the upper or lower bound may not actually be specified in resources)
  + For a date or a dateTime (and the search parameter), the interval is implicit. For example, the date 2013-01-10 specifies all the time from 00:00 on 10-Jan 2013 to immediately before 00:00 on 11-Jan 2013.
  + An instant (which is the same as a fully specified dateTime with milliseconds) is considered a fixed point in time with an interval smaller than the precision of the system, i.e. an interval with an effective width of 0.
* Date parameter searches are always matches based on the behavior of intervals, as follows:
  + For [date]=[value], the requirement is that the search interval fully contains the time of the target. i.e. 2013-01-14 includes 2013-01-14T10:00 but not 2013-01-15T00:00
  + For [date]:before=[value], the requirement is that the interval of the time before [value] intersects (i.e. overlaps) with the interval of time in the relevant resource element. For instance, the resource time 2013-01-14 is included in the set of values that come before 2013-01-14T10:00, because it includes the part of 14-Jan 2013 before 10am
  + For [date]:after=[value], the requirement is that the interval of the time after [value] intersects (i.e. overlaps) with the interval of time in the relevant resource element. For instance, the resource time 2013-01-14 is included in the set of values that come after 2013-01-14T10:00, because it includes the part of 14-Jan 2013 after 10am

If the bounds of the interval are not known (i.e. a range with no start, or a schedule like "every two days" with neither start or end), then the boundaries are implicitly considered above or below calculable time, and so these count as intersections. For instance, the period from 21-Jan 2013 onwards is included in matches for date-after=2013-03-14 because it may include times after 14-Mar 2013.

* Similarly, when the date parameter is not fully specified, matches against it are based on the behavior of intervals, where:
  + Dates with just the year specified are equivalent to an interval that starts at the first instant of January 1st to the last instant of December 31st, e.g. 2000 is equivalent to an interval of [2000-01-01T00:00, 2000-12-31T23:59]
  + Dates with the year and month are equivalent to an interval that starts at the first instant of the first day of the month and ends on the last instant of the last day of the month, eg. 2000-04 is equivalent to an interval of [2000-04-01T00:00, 2000-04-30T23:59]
* Where possible, the system should correct for timezones when performing queries. Dates do not have timezones, and timezones should not be considered. Where both search parameters and resource element date times do not have timezones, the servers local time zone should be assumed.
* Note that for a Schedule data type, the specified scheduling details are ignored and only the outer limits matter. For instance, a schedule that specifies every second day between 31-Jan 2013 and 24-Mar 2013 includes 1-Feb 2013, even though that is on an odd day that is not specified by the period. This is to keep the server load processing queries reasonable.

As an example, the following search searches for all the procedures in a patient compartment that occurred over a 2 year period:

GET [baseurl]/patient/@23/procedure?date:after=2010-01-01&date:before=2011-12-31

##### reference

A reference parameter refers to references between resources, e.g. find all Conditions where the subject reference is a particular patient by the patient id. The interpretation of a *reference* parameter is either:

* **name=id** the id of a resource (not including the @ the goes in the URL)
* **name:type=id** matches an id of a resource with a specific target type. This is useful if the resource reference can refer to multiple different resource types.

In order to save a client from doing a series of search operations, reference parameters may be "chained" by appending them with modifiers which are search parameters defined for the target resource. This can be done recursively, following a logical path through a graph of related resources. For instance, given that the resource [DiagnosticReport (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport) has a search parameter named *subject*, which is usually a reference to a [Patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient) resource, and the Patient resource includes a parameter *name* which searches on patient name, then the search

GET [baseurl]/diagnosticreport/search?subject.name=peter

is a request to return all the lab reports that have a subject whose name includes "peter". Because the Diagnostic Report subject can be one of a set of different resources, it's possible to limit the search to a particular type:

GET [baseurl]/diagnosticreport/search?subject:patient.name=peter

Advanced Search Note: Where a chained parameter searches a resource reference that may have more than one different type of resource as its target, the parameter chain may end up referring to search parameters with the same name on more than one kind of resource at once. The parameter names defined in FHIR have consistent types wherever they are used. Implementers defining their own names need to be sure that they do not create unprocessable combinations.

#### 2.2.2.2: Combining Search Parameters

The result of the search operation is the intersection of the resources that match the criteria specified by each individual search parameter. If a parameter repeats, such as /patient?language=FR&language=NL, then this matches a patient who speaks both languages. If, instead, the search is to find patients that speak either language, then this is a single parameter with multiple values, separated by a ',': /patient?language=FR,NL.

This allows for simple combinations of and/or values, but doesn't allow a search based on a pair of values, such as all observations with a sodium value >150 mmol/L (particularly as the end criteria of a chained search), or searching on Group.characteristic: you need find a combination of key/value, not an intersection of separate matches on key and value. Another example is spatial coordinates when doing geographical searches.

To allow these searches, a resource may also specify *combination* parameters that take sequences of single values that match other defined parameters as an argument. The matching parameter of each component in such a sequence is documented in the definition of the parameter. These sequences are formed by joining the single values with a "$". Note that this sequence is a single value and itself can be composed into a set of values, so that, for example, multiple matching state-on-date parameters can be specified as state-on-date=new$2013-05-04,active$2013-05-05.

#### 2.2.2.3: Selecting resources by Tag

Resources may have tags affixed to them. the \_tag resource searches for a resource by URI. For example:

condition/search?\_tag=http://acme.org/fhir/tags/needs-review

This searches for all Condition resources with the tag "http://acme.org/fhir/tags/needs-review". The \_tag search parameter may have the modifiers :partial and :text, which mean to only match on the left side of the target tags, or to search the label part of the tag respectively.

### 2.2.3: Managing Returned Resources

#### 2.2.3.1: Sorting

The client can indicate which order to return the results in using the parameter "\_sort". This can be set to one of the search parameters. Where the search parameter returns multiple values, the lowest value will be used when ordering the returned records. Note that the actual sort value used is not returned explicitly by the server.

#### 2.2.3.2: Page Count

In order to keep the load on clients, servers and the network minimized, the server may choose to return the results in a series of pages. The search result set contains the URLs that the client uses to request additional pages from the search set. For a simple RESTful search, the page links are [contained in the returned bundle as links (§2.1.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.paging).

Typically a server will its own parameters to the links that it uses to manage the state of the query as pages are retrieved. These parameters do not need to be understood or processed by the client.

The parameter \_count is defined as a hint to the server regarding how many resources should be returned in a single page. Servers SHALL not return more resources than requested (even if they don't support paging) but are allowed to return less than the client asked for. Note that it is at the discretion of the search engine how to handle ongoing updates to the resources while the search is proceeding.

#### 2.2.3.3: Including other resources in result (\_include)

Clients may request that the engine return additional resources related to the search results, in order to reduce the overall network query time. A typical case where this is useful is where the client is querying on some type of clinical resource, but for every such resource returned, the client will also need the subject (patient) resource that the clinical resource refers to. The client requests that the subject resources be included in the results set by providing one or more \_include parameters.

Each \_include parameter specifies a path to a url (usually a resource reference):

GET .../medicationprescription/search?\_include=MedicationDispense.prescription

&\_include=MedicationPrescription.prescriber&criteria...

For each returned resource, the server collects the elements described by the path, and any resources they point to that the server also holds are added to the results. This search returns all the [Medication Prescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription) resources and their [prescribing Practitioner (§3.36)](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner) Resources for the matching [Medication Dispense (§3.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense) resources.

Include paths are processed only in the context of a single resource - they can not include paths such as Resource.name1.name2 where name2 is a name in a resource pointed to by name1. Include paths may include wild cards, such as MedicationDispense.results.\*, or even \_include=\*, though both servers and clients need to take care not to request or return too many resources when doing this.

For servers, recursive and wildcard \_includes are demanding and may slow the search response time significantly. Servers are not obliged to honor requests to include additional resources in the search results.

##### External References

If the \_include path matches an url that points to a resource that the server itself does not hold itself, the server may still elect to include the target of the uri reference in the returned results as a Binary resource. For example, the include path may point to an attachment which is by reference, like this:

<content>

<contentType>image/jpeg</contentType>

<url>http://example.org/images/2343434/234234.jpg</url>

</content>

The server can retrieve the target of this reference on behalf of the client, and add this to the results for the convenience of the client.

#### 2.2.3.4: Summary

The client can request the server to return a summary portion of the resources only using the parameter "\_summary":

GET [base-url]/valueset?\_summary=true

The *\_summary* parameter requests the server to return only the elements marked as "summary" in their definition. This is used to reduce the total processing load on server, client, and resources between them such as the network. It is most useful for resources that can be large, particularly ones that include images or elements that may repeat many times.

Servers are not obliged to return just a summary, and summaries are not defined for resources where there is no need for summarization. There is only one summary form defined for each resource in order to allow servers to store the summarised form in advance.

### 2.2.4: Server Conformance

In order to allow the client to be confident about what search parameters were used as a criteria by the server, the server SHALL return the parameters that were actually used to process the search. Applications processing search results SHALL check these returned values where necessary. For example, if the server did not support some of the filters specified in the search, a client might manually apply those filters to the retrieved result set, display a warning message to the user or take some other action.

In the case of a RESTful search, these parameters are encoded in the self-link in the atom feed that is returned:

<link rel="self" href="http://example.org/patient/search?name=peter"/>

In other respects, servers have considerable discretion with regards to supporting search:

* Servers can choose which parameters to support (other than \_id above)
* Servers can choose when and where to implement parameter chaining, and when and where they support the \_include parameter
* Servers are able to declare additional parameters in the profiles referenced from their conformance statements. Servers should define search parameters starting with a "-" character to ensure that the names they choose do not clash with future parameters defined by this specification
* Servers are not required to enforce case sensitivity on parameter names, though the names are case sensitive (and URLs are generally case-sensitive)
* Servers may choose how many results to return, though the client can use \_count as above
* Servers can choose how to sort the return results, though they SHOULD honour the \_sort parameter

### 2.2.5: Advanced Search/Query

The search framework described above is a useful framework for providing a simple search based on indexed criteria, but more sophistication is needed to handle precise queries, complex decision support based requests, and direct queries that have human resolution.

More advanced search/query operations are specified by the \_query parameter:

GET .../patient?\_query=name&parameters...

The \_query parameter names a custom search profile that describes a specific search/query operation. The named query may define additional parameters that are used with that particular named query, and will define their type and behavior on repetition and omission.

FHIR defines some named queries:

* [Value Set Expansion (§3.46.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset.expansion)

In addition, servers can define their own additional named queries to meet their own uses.

There can only ever be one \_query parameter in a set of search parameters. Servers processing search requests must refuse to process a search request if they do not recognise the \_query parameter value.

Some named queries may have side effects such as creating new clinical resources that may be persistent or transitory. The general search defined above always searches existing resources, and the only new resources that may be created are [Security Event (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) resources auditing the search.

### 2.2.6: Executing Search / Query

FHIR defines 3 different ways in which a search through a repository of resources can be initiated:

* Perform [search (§2.1.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.search) operation on a RESTful interface (as described above)
* Send a query message, and receive a query response
* On a RESTful interface, create a query resource with an order, and wait for the order response (this allows asynchronous queries across a RESTful interface)

In all 3 cases, the basic operation is simple: given a set of parameters which are name/value pairs, perform a query against a repository of resources, and return the set of matching resources, possibly with some additional related resources. The second two search methods are implemented using the *Query* Resource.

### 2.2.7: Query Resource

The resource is used to perform queries using messaging-based exchanges, and to perform asynchronous searches using the RESTful interface.

### 2.2.8: Resource Content

See also the [Examples (§4.45)](http://hl7.org/implement/standards/fhir/fhir-book.htm#queryEx) and the [Definitions (§5.47)](http://hl7.org/implement/standards/fhir/fhir-book.htm#queryDefn).

<[**Query**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.identifier) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **1..1** Links query and its response(s) -->

<[**parameter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.parameter)><!-- **1..\*** [Extension](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.Extension) Set of query parameters with values --></parameter>

<[**response**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response)> <!-- **0..1** If this is a response to a query -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.identifier) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **1..1** Links response to source query -->

<[**outcome**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.outcome) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Outcome of processing the query](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-outcome) -->

<[**total**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.total) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Total number of matching records -->

<[**parameter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.parameter)><!-- **0..\*** [Extension](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.Extension) Parameters server used --></parameter>

<[**first**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.first)><!-- **0..\*** [Extension](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.Extension) To get first page (if paged) --></first>

<[**previous**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.previous)><!-- **0..\*** [Extension](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.Extension) To get previous page (if paged) --></previous>

<[**next**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.next)><!-- **0..\*** [Extension](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.Extension) To get next page (if paged) --></next>

<[**last**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.last)><!-- **0..\*** [Extension](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.Extension) To get last page (if paged) --></last>

<[**reference**](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-definitions.Query.response.reference)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Resources that are the results of the search --></reference>

</response>

</Query>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/query.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/query.profile.xml)

#### 2.2.8.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Query.response.outcome | The outcome of processing a query request | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/query-outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-outcome) |

Notes about the Query resource:

* The id is usually a UUID (urn:uuid:...). Its sole use is to match request and response logically
* The parameters defined for use with the query the resource are all those described above
* The [extension (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#extexibility) type is used for parameters. The namespace http://hl7.org/fhir/query is used in the uri value for all the named parameters. Other namespaces may be used for parameters that would/could not appear in the named parameter list in a query url.
* Parameter names are mandatory, and values are optional. Parameters with missing values are ignored when processing the query
* Parameter names do not need to be unique. The interpretation of multiple search parameters is as described above
* There SHALL be at least one parameter provided with a search - a search request without any request cannot be processed
* The search engine SHALL return the parameters used to process the search so the client knows what search was performed
* The links to first, previous, next and last pages in the query result set are provided at the discretion of the server. The client performs a new query using those parameters to retrieve the specified pages. If no parameters are returned, there is no link to follow
* The references to the result set are usually version specific references
* The query resource contains an outcome code. There is no way to represent the code "limited" in a RESTful query where there is no query resource

#### 2.2.8.2: Messaging based Queries

In order to initiate a message-based query, a sender sends a message consisting of a [Message (§2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message) resource, and a *Query* resource. The message resource routes the message to the correct destination, and the query contains the parameters of the search that is requested. See [the examples (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-examples) for an example query request message.

The receiver processes the message, and then returns a message with a message header, a query with a response details, and a set of resources that meet the query criteria. See [the examples (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-examples) for an example query response message.

If the sender wishes to retrieve additional pages from the original search, the sender constructs a new query with the parameters specified by the search processing system, and the cycle starts again.

#### 2.2.8.3: Asynchronous Queries on a REST framework

The RESTful framework provides a simple convenient synchronous search based on request/response as described above. This works well as long it doesn't take very long to process a query. As the query processing time gets longer, the synchronous search starts to take too long to manage in this kind of framework. In particular, some queries may require human intervention to process correctly, or may even by direct human-human queries. For these, some asynchronous approach is required. The messaging solution discussed above can be used asynchronously, but it's also possible to implement asynchronous queries in a RESTful environment. Here's how this would work:

1. The requester constructs a *Query* resource, and performs a create operation to the /query endpoint, and gets the id of the query resource on the server
2. The requester constructs an [Order (§3.31)](http://hl7.org/implement/standards/fhir/fhir-book.htm#order) resource that contains details as appropriate, and which as the query resource as its order detail, and creates that on the server
3. A responder picks up the existence of the order resource (either the server acting directly, or a client that is subscribed to the order feed on the server)
4. The responder retrieves the query, and then processes it, generating a new query resource that is the response, and then creates that on the server
5. The responder constructs an [Order Response (§3.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse) resource with a reference to the request from Step #2, a code of "complete", and a fulfillment that points to the query response from step #4
6. The requester sees the existence of the order response (e.g. by subscribing - watching the updates to *Order Response* on the server), and retrieves the query response
7. The requester retrieves the matching resources by iterating through the matching resources and retrieving them based on their reference.

This pattern is more complex than the other uses, so will be used less. There are several variations on this theme. For instance, the requester may choose to perform the first two operations as a [transaction (§2.1.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.transaction), or the responder may choose to inform the requester that processing as commenced with an order response code of "accepted".

Note that it's also possible to expose service end points in a SOA fashion that use the query resource and/or definitions in other ways, though such usages are not described in FHIR.

### 2.2.9: Search/Query Result Currency

The results of a search/query operation are only guaranteed to be current at the moment the operation is executed. After the operation is executed, ongoing actions performed on the resources against which the query was executed will render the results increasingly stale. The significance of this depends on the nature of the search, and the kind of use that is being made of the results.

This is particularly relevant when the server is returning the results in a series of pages. It is at the discretion of the search engine how to handle ongoing updates to the resources while the search is proceeding.

Query result sets may include resources created by the processing of the search. Typically, these are the results of queries for decision support, value set expansion, etc., and represent the outcome of processing the query. In order to be usable in the scenarios above, these resources have a defined structure and have the same metadata as any other resource, including a known identity, but they have the same currency issues as the results from a query.

Applications handling the results of an operation that creates resources should use these resources with careful consideration of their currency. Though the resources may be retained for audit purposes, implementers must be careful not to reuse these as if they are current.

note: known issues relating to this page:

* The question of searching on a particular resource (as described by the RESTful interface). is this a parameter? Should the restful search operate at the system level as well?
* The overlap between query response and operation outcome in the case of errors in them messaging context

### 2.2.10: Searching the Searches

As a consequence of the general framework, it is possible to search on a set of stored queries, though there is no known particular use case for doing so.

### 2.2.11: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| id : token | Links query and its response(s) | Query.identifier |
| response : token | Links response to source query | Query.response.identifier |

## 2.3: Resource Definition: Message

A transmission requesting action on a bundle of one or more resources or a response to such a request.

This page describes how FHIR Resources can be used in a traditional messaging context, much like HL7 v2. Applications claiming conformance to this framework claim to be conformant to "FHIR messaging".

In FHIR messaging, a "request message" is sent from a source application to a destination application when an event happens. Events mostly correspond to things that happen in the real world. The request message consists of a [bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) of resources, with the first resource in the bundle being this *Message* resource. The Message resource has a code - the message event - that identifies the nature of the request message and carries additional request metadata. The other resources in the bundle depend on the type of the request.

The events supported in FHIR, along with the resources that are included in them, are defined below.

The destination application processes the request and returns one or more response messages which are also a [bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) of resources, with the first resource in the bundle being a [Message (§2.3.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message.resource) resource with a response section that reports the outcome of processing the message and any additional response resources required.

### 2.3.1: Basic Messaging Assumptions

This specification assumes that content will be delivered from one application to another by some delivery mechanism, and then a response will be returned to the source application. The exact mechanism of transfer is irrelevant to this specification, but may include file transfer, http based transfer, MLLP (HL7 minimal lower layer protocol), MQ series messaging or anything else. The only requirement for the transfer layer is that requests are sent to a known location and responses are returned to the source of the request. This specification considers the source and destination applications as logical entities, and the mapping from logical source and destination to implementation specific addresses is outside the scope of this specification.

In principle, source applications are not required to wait for a response to a transaction before issuing a new transaction. However in many cases, the messages in a given stream are dependent on each other, and must be sent and processed in order. In addition, some transfer methods may require sequential delivery of messages.

This specification ignores the existence of interface engines and message transfer agents that exist between the *source* and *destination*. Either they are transparent to the message/transaction content and irrelevant to this specification, or they are actively involved in manipulating the message content. If these middleware agents are modifying the message content, then they become responsible for honoring the contract that applies (including applicable profiles) in both directions.

#### 2.3.1.1: Message Identifiers

An incoming message contains two identifiers: the envelope id ([feed (§1.3.8.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.atom).id) and the [message (§2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message).id. Each time a new message is created, it must be assigned an identifier that is unique within that message stream. Note that since message streams are often merged with other streams, it is recommended that the id should be globally unique. This can be achieved by using a UUID or an OID or appropriately chosen URI with a serially incrementing number. Each time a message is sent, the bundle identifier should be changed to a new identifier.

When a receiver receives and processes the message, it responds with a new message with a new id, wrapped in a bundle which also has a new id. The response message also quotes the request message id so that the source system can relate the response to its request.

#### 2.3.1.2: Absence of Reliable Messaging

Some of the message delivery mechanisms mentioned above are reliable delivery systems - the message is always delivered, or an appropriate error is returned to the source. However most implementations use methods which do not provide reliable messaging, and either the request or the response can get lost in transit. FHIR messaging describes a simple approach to handle this that receivers should conform to in order to maintain predictable functionality even when messaging is not reliable.

When considering the issue of reliable messaging, the source application should consider whether the message is a message of consequence, or a message of currency. A message of consequence is one where the message requests a change that should not be processed more than once, and where the sender needs the response that results from processing the message. A message of currency is where the correct response is the very latest information available. Typically, this is status information. Some messages fit into neither category - the response does not particularly matter. Usually these are notification messages.

In order to enable these processing rules, and to benefit from them, the original sender of the message SHALL do the following when it receives no response to a message within a configured timeout period:

|  |  |
| --- | --- |
| Consequence | Resend the same message (including with the same id) with the same envelope id |
| Currency | Resend the same message (including with the same id) with a different envelope id |
| Neither | Resend the same message (including with the same id) with a different envelope id |

When a receiver declares that it implements reliable answers, it SHALL check the incoming envelope and message ids against a cache of previously received messages. The correct action to take depends on what is received:

|  |  |
| --- | --- |
| Both the envelope and message id have not been received | This is the normal case, and the message should be processed |
| Both envelope & message already received | The original response has been lost (failed to return to the request issuer), and the original response must be resent |
| The message id has already been received, but the envelope id is new | A previously seen message has been resubmitted for processing again. The server may either reprocess the message, or reject the message |
| The envelope id has already been received, but the message id is new | This is an error - envelope ids should never be reused |

The duration period for caching does generally not need to very long. At a minimum, it could be 1 minute longer than the timeout of the sending system, though it may need to be longer depending on the re-sending policies of the sending system.

TODO: describe some use cases

### 2.3.2: Conformance Statement

Applications may only claim to be conformant to "FHIR messaging" if they publish a conformance statement so the claim may be verified. A conformance statement lists all the message events they support (either as sender or receiver) and for each event, a profile that states which resources are bundled (sender), or are required to be bundled (receiver), and any rules about the information content of the individual resources. The conformance statement is a [resource with the name "Conformance" (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance).

### 2.3.3: Messaging End-points

There are two end-points defined for a RESTful server that supports Messages:

* [baseurl]/message/: a normal RESTful end point for message resources
* [baseurl]/mailbox: an address at which messages can be delivered

The first end-point is used for working within the message contents, for instance, for building messages piecemeal or for auditing received messages. **Creating or updating Message resources to this end point does not represent the actual occurrence of any event, nor can it trigger any logic associated with the actual event.** It is just for managing message resources.

The second end-point is used for actually sending messages as [bundles (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle), to indicate that the event identified by the code has occurred. The end-point responds with a message response as defined for the particular event, or an error indicating that the attempt to process the message was unsuccessful. The functionality of this end-point [is described below (§2.3.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message.mailbox).

Note: While the end-points above are defined for use with message resources and for delivering messages to a RESTful server, it is not necessary to use them; messages may be transported between systems using any method desired.

### 2.3.4: Resource Content

See also the [Examples (§4.33)](http://hl7.org/implement/standards/fhir/fhir-book.htm#messageEx) and the [Definitions (§5.35)](http://hl7.org/implement/standards/fhir/fhir-book.htm#messageDefn).

<[**Message**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.identifier) value="[[id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id)]"/><!-- **1..1** Id of this message -->

<[**timestamp**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.timestamp) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **1..1** Time that the message was sent -->

<[**event**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.event) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Code for the event his message represents](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-events) -->

<[**response**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.response)> <!-- **0..1** If this is a reply to prior message -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.response.identifier) value="[[id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id)]"/><!-- **1..1** Id of original message -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.response.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Type of response to the message](http://hl7.org/implement/standards/fhir/fhir-book.htm#response-code) -->

<[**details**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.response.details)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([OperationOutcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome.OperationOutcome)) Specific list of hints/warnings/errors --></details>

</response>

<[**source**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.source)> <!-- **1..1** Message Source Application -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.source.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name of system -->

<[**software**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.source.software) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Name of software running the system -->

<[**version**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.source.version) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Version of software running -->

<[**contact**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.source.contact)><!-- **0..1** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) Human contact for problems --></contact>

<[**endpoint**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.source.endpoint) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **1..1** Actual message source address or id -->

</source>

<[**destination**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.destination)> <!-- **1..1** Message Destination Application -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.destination.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name of system -->

<[**target**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.destination.target)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Particular delivery destination within the destination --></target>

<[**endpoint**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.destination.endpoint) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **1..1** Actual destination address or id -->

</destination>

<[**enterer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.enterer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) The source of the data entry --></enterer>

<[**author**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.author)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) The source of the decision --></author>

<[**receiver**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.receiver)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Intended "real-world" recipient for the data --></receiver>

<[**responsible**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.responsible)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Final responsibility for event --></responsible>

<[**effective**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.effective)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Time of effect --></effective>

<[**reason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.reason)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Cause of event --></reason>

<[**data**](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-definitions.Message.data)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) The actual content of the message --></data>

</Message>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/message.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/message.profile.xml)

#### 2.3.4.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Message.event | One of the message events defined as part of FHIR | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/message-events (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-events) |
| Message.response.code | The kind of response to a message | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/response-code](http://hl7.org/implement/standards/fhir/fhir-book.htm#response-code) |
| Message.reason | The reason for an event occurring | Unknown | No details provided yet |

### 2.3.5: Notes:

* The resource references enterer, author and responsible may all be included in the bundle or left out on the basis that the recipient (and any intermediaries) are able to locate/resolve the resources independently. The former would be suitable for loosely coupled systems, and the latter for tightly coupled systems. The messaging conformance statement for an application may reference [a profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) that describes how the bundling occurs
* The actual content of the data resource is specified for each message event. The data resource is always included in the bundle

### 2.3.6: Event List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Description** | **Request** | **Response** | **Notes** |
| MedicationAdministration-Complete | Change the status of a Medication Administration to show that it is complete. | MedicationAdministration | MedicationAdministration |  |
| MedicationAdministration-Nullification | Someone wishes to record that the record of administration of a medication is in error and should be ignored. | MedicationAdministration | MedicationAdministration |  |
| MedicationAdministration-Recording | Indicates that a medication has been recorded against the patient's record | MedicationAdministration | MedicationAdministration |  |
| MedicationAdministration-Update | Update a Medication Administration record. | MedicationAdministration | MedicationAdministration |  |
| admin-notify | Notification of a change to an administrative resource (either create or update). Note that there is no delete, though some administrative resources have status or period elements for this use | Device | -- |  |
| Device | -- |  |
| Group | -- |  |
| diagnosticreport-provide | Provide a diagnostic report, or update a previously provided diagnostic report | DiagnosticReport  DiagnosticReport.patient  DiagnosticReport.perfomer  DiagnosticReport.results.specimen  DiagnosticReport.results.result  DiagnosticReport.image | -- |  |
| observation-provide | Provide a simple observation or update a previously provided simple observation | Observation  Observation.subjectPatient  Observation.subjectPatient.person  Observation.subjectGroup  Observation.subjectDevice  Observation.subjectAnimal  Observation.performerAgent  Observation.performerAgent.person  Observation.performerPatient  Observation.performerPerson | -- |  |
| query | Request to perform a query according to the attached query resource | query | query |  |
| query-response | Response with the result of processing the query | query | -- | Used when queries are performed asynchronously |

### 2.3.7: Mailbox

The mailbox is the standard name for a service hosted on a RESTful server that accepts messages and processes them as transactions and returns a message response appropriate for the message received. The server is under no obligation to do anything particular with the resources except as required by the semantics of the event code in the message resource. A server may choose to retain the resources and make them available on a RESTful interface, but is not required to do so. If the server returns 200 Ok, it must return a valid message that indicates what the outcome of the event processing is. An HTTP error indicates that the message was not processed successfully and that it should be resubmitted (and doing so should not result in a duplicate message response). Repeated failures indicate either a fatal problem with the message or a problem with the receiving application.

The mailbox can also be used to accept documents. In this case, the document is "accepted" (the server takes responsibility for custody of the received document) and an HTTP status of 204 No Content is returned, or an HTTP error is returned. The server is under no obligation to do anything with the document except as specific trading partner agreements dictate.

The following rules apply to the mailbox:

* The mailbox only accepts POST transactions - any other HTTP method will result in an HTTP error
* The request content type submitted is always [a bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) containing a message or document resource as the first resource
* The response content type returned is always an HTTP error, [a bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) containing a message as the first resource, or empty (if a document was received)
* If the response is an error, the body SHOULD be an [Errors & Warning (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) resource with full details
* The URL never takes any parameters
* The mailbox may be authenticated using standard HTTP authentication methods, including OAuth

This simple mailbox profile can be used by any HTTP end point that accepts FHIR messages or documents, not just FHIR RESTful servers.

In order to ensure consistency of processing, the [logical rules regarding processing of envelope id and message id described above (§2.3.1.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message.reliable) SHALL be followed when messages are processed using the MailBox. No such rules apply regarding documents - if the client receives no response, it should continue to submit the document until it does. Servers SHALL accept multiple document submissions and process them correctly.

### 2.3.8: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |

## 2.4: Resource Definition: Document

A documentation of healthcare-related information that is assembled together into a single statement of meaning that establishes its own context. A document is composed of a set of resources that include both human and computer readable portions. A human may attest to the accuracy of the human readable portion and may authenticate and/or sign the entire whole. A document may be kept as a set of logically linked resources, or they may be bundled together in an atom feed.

FHIR resources can be used to build clinical documents that capture information about clinical observations and services. A clinical document is a [bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) (a list of resources in an [atom feed (§1.3.8.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.atom)) that is fixed in scope, frozen in time and authored and/or attested as a set of logically contained resources by humans, organisations and devices. Documents built in this fashion may be exchanged between systems and also persisted in document storage and management systems, including systems such as IHE XDS. Applications claiming conformance to this framework claim to be conformant to "FHIR documents".

Note that FHIR defines both this document format and also a [document reference resource (§3.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference). FHIR documents are for documents that are authored and assembled in FHIR, while the document reference resource is for general references to other documents.

### 2.4.1: Document Content

All documents have the same structure: a [bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) that has a *Document* resource (see below) first, followed by a series of other resources referenced from the *Document* header that provides guidance on how they fit together. The bundle gathers all the content of the document into a single XML document which may be signed and managed as required. The resources include both human and computer readable portions.

The document resource identifies the document and its purpose, sets the context of the document and carries key information such as the subject and author. It also divides the document up into a series of sections that contain other resources identified in this specification that carry the content. Any resource referenced directly in the Document resource must be included in the bundle when the document is assembled. Other resources that these referenced resources refer to may also be included in the bundle if the document originator chooses to.

[Document profiles (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) can make additional rules about which resources must be included in the bundle along with the resources that are directly referenced in the Document resource. In addition, Document Profiles can specify what sections a document contains and what the constraints on those contents are. Applications should consider publishing [conformance statements (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) that identify particular documents they support.

### 2.4.2: Document End-Points

There are two RESTful end-points used for Documents:

* [baseurl]/document/: a normal RESTful end point for document resources as standalone resources
* [baseurl]/binary/: for documents as [bundles (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle)

Note: While these end-points are defined for use with document resources and document bundles, it is not necessary to use them. Documents may be transferred between systems by using the [MailBox (§2.3.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message.mailbox) target, or by using any other method desired.

### 2.4.3: Resource Content

See also the [Examples (§4.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentEx) and the [Definitions (§5.19)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentDefn).

<[**Document**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Logical identifier for document (version-independent) § --></identifier>

<[**versionIdentifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.versionIdentifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Version-specific identifier for document § --></versionIdentifier>

<[**created**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.created) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **1..1** Document creation time § -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Kind of document (LOINC if possible) §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-codes) --></type>

<[**subtype**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.subtype)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [More detail about the document type §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-typecodes) --></subtype>

<[**title**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.title) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Document title § -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Status of this document §](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-status) -->

<[**confidentiality**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.confidentiality)><!-- **1..1** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) [As defined by affinity domain §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-confidentiality) --></confidentiality>

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who/what the document is about § --></subject>

<[**author**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.author)><!-- **1..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who/what authored the final document § --></author>

<[**attester**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.attester)> <!-- **0..\*** Attests to accuracy of document § -->

<[**mode**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.attester.mode) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [personal | professional | legal | official §](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-attestation-mode) -->

<[**time**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.attester.time) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When document attested § -->

<[**party**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.attester.party)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Who attested the document § --></party>

</attester>

<[**custodian**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.custodian)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Org which maintains the document § --></custodian>

<[**event**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.event)> <!-- **0..1** The clinical event/act/item being documented § -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.event.code)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Code(s) that apply to the event being documented §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-event-code) --></code>

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.event.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) The period covered by the document § --></period>

<[**detail**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.event.detail)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Full details for the event(s) the document concents § --></detail>

</event>

<[**encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.encounter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)|[InterestOfCare](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Context of the document § --></encounter>

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<[**provenance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.provenance)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Provenance](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance.Provenance)) Additional provenance about the document and its parts --></provenance>

<[**stylesheet**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.stylesheet)><!-- **0..1** [Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) Stylesheet to use when rendering the document --></stylesheet>

<[**representation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.representation)><!-- **0..1** [Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) Alternative representation of the document --></representation>

<[**section**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.section)> <!-- **0..\*** Document is broken into sections -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.section.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Classification of section (recommended)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-section-codes) --></code>

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.section.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) If section different to document --></subject>

<[**content**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.section.content)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) The actual data for the section --></content>

<[**section**](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-definitions.Document.section.section)><!-- **0..\*** Content as for Document.section Nested Section --></section>

</section>

</Document>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/document.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/document.profile.xml)

#### 2.4.3.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Document.type | Type of a clinical document | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/doc-codes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-codes) |
| Document.subtype | Subtype of a clinical document | Example | [http://hl7.org/fhir/vs/xds-typecodes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-typecodes) |
| Document.status | The workflow/clinical status of this document | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/document-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-status) |
| Document.confidentiality | Codes specifying the level of confidentiality of the XDS Document | Example | [http://hl7.org/fhir/vs/doc-confidentiality (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-confidentiality) |
| Document.attester.mode | The way in which a person authenticated a document | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/document-attestation-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-attestation-mode) |
| Document.event.code | This list of codes represents the main clinical acts being documented | Example | [http://hl7.org/fhir/vs/doc-event-code (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-event-code) |
| Document.section.code | Classification of a clinical document section | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/doc-section-codes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-section-codes) |

#### 2.4.3.2: Constraints

* A document must have a representation, one or more sections or both (xpath: exists(f:representation) or exists(f:section))
* On Document.stylesheet: A document stylesheet must have a mime type of text/css (xpath on f:Document/f:stylesheet: f:mimeType/@value = 'text/css')
* On Document.section: A section must have content or one or more sections, but not both. (xpath on f:Document/f:section: exists(f:content) != exists(f:section))

### 2.4.4: Notes:

* The author and the attester are often the same person, but this may not be the case in some clinical workflows
* The attester attests to the collated narrative portions of the document resource, the subject resource, and the resources referred to in the Document.section.content references. When a document is bundled, additional resources can be included, but these are not attested content
* The custodian is responsible for the maintenance of the document. Principally, they are responsible for the policy regarding persistence of the documents. They need not actually retain a copy of the document, but they should do so.

### 2.4.5: Identifying a Document

There are two identifiers on the document information: *id* and *versionId*. These allow either a logical document id or a version specific id to be provided, or both. This supports multiple different identification strategies. The following combinations are allowed:

* A fully specified (both [Identifier (§1.4.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) system and id) element is present for both *id* and *versionId*. This is the preferred option: globally unique identifiers for both version and non-version specify the document
* A fully specified element for the *id* element and a local id (no system) for the version number. This is equivalent to a document id and a version number. In this case the version number is assumed to be unique within the version series of the document identified by the *id* element
* A fully specified *versionId* with no *id* - this version of this document is identified, but there is no version independent reference. This is discouraged, as explicit replacement tracking will be required and this can be broken by missing links in the version chain

Any other combinations do not globally uniquely identity a document and are therefore not allowed.

Note that there is an additional identifier - the bundle identifier itself ([atom (§1.3.8.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.atom) feed.id). This must be an absolute URI - in effect globally unique - but has no other particular meaning anywhere else in the specification. For a document, it can be populated with some URI that is extracted from the *versionId* or *id* above, or it can be a new UUID that has no other associated use. Implementers should not rely on its value matching one of the formal document identification elements.

### 2.4.6: Presenting a Document

The human display of the Document is the collated narrative portions of following resources (in order):

1. The Document itself
2. The Subject resource
3. Resources referenced in the *section.content*

The document narrative should summarize the important parts of the document header that are required to establish clinical context for the document (other than the subject, which is displayed in its own right). To actually build the combined narrative, simply append all the narrative <div> fragments.

#### 2.4.6.1: Styling Documents

In addition to the [basic style rules (§1.3.2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.css), which must be followed, a document can contain a style sheet that contains additional styles that apply to the collated narrative. Unless otherwise agreed in local trading partner agreements, applications displaying the collated narrative should use the style sheet provided in the document. Parties entering into such a trading agreement should consider the implications it will have on their long term scope for document exchange very carefully. If the parties agree on a stylesheet that is not contained in the document, then it is likely that they will never be able to share their documents in a more general context, such as a regional or national EHR, or a global personal health record.

### 2.4.7: Document Handling Obligations

The authors and users of Clinical Documents, whether human or software, have obligations that they must satisfy.

#### 2.4.7.1: Author Obligations

A document author is an application that creates a document resource. The author may create new content resources and/or assemble already existing content resources while doing so. A document author has the following responsibilities:

* Build a valid document header that conforms to the Document rules explained here and that only links to other valid resources
* Ensure that the content of the document and other resources conforms to any declared [Profiles (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile).
* Ensure that the attesters are properly aware of the presentation of the document to which they are attesting

#### 2.4.7.2: User Obligations

A document user is an application that receives or presents documents, or extracts data from them, or makes decisions because of them. The documents may be received directly from a document author, accessed via a document management system or forward by a third party. The document user is responsible for ensuring that received documents are processed and/or rendered in accordance to this specification. A document recipient has the following obligations:

* When storing/transmitting a document, any method may be used as long as the bundled document can be (re-)assembled with sufficient integrity to validate a digital signature (i.e. it is legitimate to unbundle the resources and store them on a FHIR RESTful server, but this is not required)
* When presenting the narrative of the document, the rules described above must be followed
* A user is allowed to extract resources or data from the document for other use, but such data is no longer considered to be attested by the document author
* Wherever the data (or information derived from it) is displayed to a user, there should always be a way for the user to access a presentation of the original document
* It must correctly determine when a document has been superseded (according the statements made in the *setId*, *version* or *replaces* elements of received documents or those in the source document management system) and either withdraw data extracted from superseded documents, or warn users when they view the document

### 2.4.8: Implementation Notes

* Document Bundles may be signed using digital signatures following the rules laid out in the [Atom specification (http://tools.ietf.org/html/rfc4287)](http://tools.ietf.org/html/rfc4287) . The signature SHOULD be provided by a listed attester of the document and the signature SHOULD contain a [KeyInfo element (http://www.w3.org/TR/xmldsig-core/#sec-KeyInfo)](http://www.w3.org/TR/xmldsig-core/#sec-KeyInfo) that contains a KeyName element whose value is a URI that matches the Atom *link* element value for the matching attester resource.

### 2.4.9: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| attester : reference | attester of the document | Document.attester.party |
| author : reference | author of the document | Document.author |
| context : token | context of the document | Document.event.code |
| date : date | the document creation time | Document.created |
| identifier : token | Logical identifier for document (version-independent) | Document.identifier |
| section-content : reference | content resource of the section | Document.section.content |
| section-type : token | code of the document | Document.section.code |
| subject : reference | subject of the document | Document.subject |
| type : token | the type of the document | Document.type |
| version : token | Version-specific identifier for document | Document.versionIdentifier |

**On This Page:**

[PHR (§2.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#usecases.phr)

[Document Sharing (XDS) (§2.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#usecases.xds)

[Decision Support (§2.5.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#usecases.decision)

## 2.5: Common Scenarios in FHIR

FHIR is a framework standard that defines a common way to solve healthcare problems, and provides a set of resources that can be used in many different ways. This page describes how certain common usage scenarios are implemented using the capabilities that FHIR defines.

### 2.5.1: Personal Health Record (PHR)

In the PHR scenario, an Electronic Medical Record system (EMR, though many other names and acronyms are also used) provides a RESTful API that allows patients to access their own medical record via a common web portal or mobile application, usually provided by a third party. In this scenario, the PHR provider:

* Provides the patient with a login that identifies them (or links the patient record to an external identity provided by OpenID, Facebook, Google, etc.)
* Authenticates the client using an appropriate OAuth server for the login (possibly their own) and restricts the client to viewing records associated with the specific patient (or patients, where appropriate access has been arranged)

The EMR exposes a FHIR server that supports the *search* and *read* operations on the following resources:

1. the [patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient) resource in order to provide demographics to the client. When a client searches patients with no search criteria, they get a list of all patients they have access too
2. *search* and *read* on the [Document Reference (§3.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference) resource to provide access to general patient documents in the form of PDFs etc. (PDFs are preferred)
3. *search* and *read* on a set of clinical resources potentially including Observation, DiagnosticReport, various Medication resources, AdverseReaction/AllergyIntolerance, CarePlan, and Condition

Here is the conformance Profile for this scenario: [XML](http://hl7.org/implement/standards/fhir/conformance-phr-example.xml) [(for browser) (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-phr-example) or [JSON](http://hl7.org/implement/standards/fhir/conformance-phr-example.json) [(for browser) (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-phr-example).

The EMR may also choose to provide additional functionality, such as shared access to patient records by relatives/carers, to allow the patient to upload their own documents, medication statements, observations (e.g. from patient monitoring devices) and/or to allow the patient to make appointments. This additional functionality will involve additional API capabilities to be implemented and exposed. The EMR server may also choose to expose the *read*, *search* and *updates* operation on the Security Event resource for the patient-specific records to allow patient review of record access. Note that all usage of the RESTful API should be logged in SecurityEvent resources.

### 2.5.2: Document Sharing (XDS)

One common way to integrate healthcare information from a variety of sources is to build a repository of documents around a patient record. Building a repository of documents allows for less stringent alignment around policy, procedures, and record-keeping/informatics standards.

The most widely adopted framework for sharing documents within institutions, regions, states or countries is IHE Cross-Enterprise Document Sharing (XDS). XDS allows for a federated system of repositories with a registry to provide co-ordinated access to the documents.

FHIR provides equivalent functionality to XDS that can be used to implement XDS behind the existing XDS.b interface, to provide a simpler mobile-friendly interface to an existing XDS eco-system, or to link document sharing into other functionality provided through a FHIR interface.

The following FHIR Resources are involved in the XDS functionality:

* The [DocumentReference (§3.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference) resource describes a document that is located elsewhere. A document registry is a system that maintains a set of Document References
* The [XDS profile (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#xds-profile) provides specific XDS implementation detail for the more general DocumentReference resource
* The [Binary (§2.1.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.binary) support can be used to store the actual documents on a FHIR server. A repository is a system that stores the binary document in addition to Document References (or sometimes without)
* [Patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient), [Practitioner (§3.36)](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner) and [Organization (§3.33)](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization) resources provide support for identifying people and organizations
* The [SecurityEvent (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) resource tracks usage of the document registry and repository

At present, IHE is working with the FHIR project team to use FHIR for Mobile Health Documents (MHD).

### 2.5.3: Decision Support

## 2.6: FHIR Security

Fast Healthcare Interoperability Resources (FHIR) is not a security protocol, nor does it define any security related functionality. However FHIR does define exchange protocols and content models that need to be used with various security protocols defined elsewhere. This section gathers all information about security in one section. A summary:

* Communications Security - all exchange of production data should be secured using TLS/SSL (e.g. https)
* Authentication - Users/Clients may be authenticated in any way desired. For web-centric use, OAuth is recommended
* Authorization/Access Control - FHIR defines a Security Label infrastructure to support access control management. FHIR may also define a set of resources to administer access control management, but does not do so at present
* Audit - FHIR defines [provenance (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) and [security event (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) resources suitable for tracking the origins, authorship, history, status and access of resources
* Digital Signatures - FHIR includes several specifically reserved locations for digital signatures
* Attachments - FHIR allows for binary resources and attachments. These have their own concerns

Time critical concerns regarding security flaws in the FHIR specification should be addressed to the [FHIR email list (http://wiki.hl7.org/index.php?title=FHIR\_email\_list\_subscription\_instructions)](http://wiki.hl7.org/index.php?title=FHIR_email_list_subscription_instructions) for prompt consideration. Alternatively, issues can be raised through the [community input (http://wiki.hl7.org/index.php?title=FHIR\_Security\_Page)](http://wiki.hl7.org/index.php?title=FHIR_Security_Page) mechanism.

Implementers should track developing IHE IUA Profile for additional security considerations.

A production FHIR system will need some kind of security sub-system that administers users, user authentication and user-authorization. Where this sub-system fits into the deployment architecture is a matter for system design:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | |  |  | | --- | --- | |  | The consumer that is using a healthcare related system | |  | The client application the user is using (application, mobile app, website, etc.) | |  | The security system that authenticates and authorizes the user | |  | The clinical/healthcare repository | |

In this diagram, the red lines represent FHIR interfaces. From the perspective of the FHIR API, the client (consumer of FHIR services) may either interact with a security system that manifests as a FHIR server, and which depends on a subsequent FHIR interface to provide the actual storage, or either the client or server interacts with the security system independently. In each of these 3 scenarios, the different components may be assembled into applications or networks components differently, but the same logical layout applies.

The FHIR specification assumes that a security system exists, and that it may be deployed in front or behind the FHIR API. Because there are a plethora of standards relating to the administration and functionality of the security system, FHIR does not provide user, profile, or other such administration resources. Instead, the FHIR resources are the targets of the policies expressed in these other approaches. What FHIR does specify is a way to apply security labels to resources so that a security system may use these (along with the contents of the resources if appropriate) to determine whether a user is authorised to perform a particular FHIR operation or not.

### 2.6.1: Communications

For the [RESTful API](http://hl7.org/implement/standards/fhir/fhir-book.htm#http), normal HTTP security rules apply. The [Service Root URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.root) will specify whether SSL is required. Client authentication may be required by the server, possibly including the requirement for client certificates.

### 2.6.2: Authentication

Other than testing systems, FHIR servers should authenticate the clients. The server may choose to authenticate the client system and trust it, or to authenticate the individual user by a variety of techniques. For web-centric use, [OAuth (http://oauth.net/)](http://oauth.net/) may be used to authenticate and/or authorise the users.

### 2.6.3: Authorization/Access Control

todo

 Mapping - However authentication is done, there may need to be mapping between security protocol identification and device, person and organisation resources

### 2.6.4: Mapping between resources and security systems

Correctly identifying people, devices, locations and organisations is one of the foundations that any security system is built on. Most uses of security protocols, whether authentication, access control, digital signatures etc. rely on the correct mapping between the relevant resources and the underlying systems. Note that this isn't necessary: there is nothing in FHIR that requires or relies on any security being in place, or any particular implementation. But real world usage will generally require this.

Todo.. outline general considerations

### 2.6.5: Digital Signatures

to do

### 2.6.6: Attachments

Several FHIR resources include attachments. Attachments can either be references to content found elsewhere, or included inline encoded in base64. Attachments represent security risks in a way that FHIR resources do not, since some attachments contain executable code. Implementers should always use caution when handling resources.

### 2.6.7: Security Labels

# 3: Resource List

## 3.6: Resources

The FHIR specification presently defines the following resources:

The list of resources is growing as FHIR is developed. Over the coming months, the number of resources and the number of those that have been vetted by HL7 committees will grow. A list of hypothesized list of resources can be found on the [HL7 wiki (http://wiki.hl7.org/index.php?title=FHIR\_Resource\_Types)](http://wiki.hl7.org/index.php?title=FHIR_Resource_Types) . Feel free to add any you feel are missing or engage with one of the [HL7 Work Groups (http://www.hl7.org/Special/committees/index.cfm)](http://www.hl7.org/Special/committees/index.cfm) to submit a [proposal (http://wiki.hl7.org/index.php?title=Category:FHIR\_Resource\_Proposal)](http://wiki.hl7.org/index.php?title=Category:FHIR_Resource_Proposal) to define a resource of particular interest.

|  |  |
| --- | --- |
|  | |
| **Administrative** | |
| Administrative resources tie clinical processes to the administrative process that support them - patient and provider management. These resources are also known as the attribution layer | |
| [Patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient) | Demographics and other administrative information about a person or animal receiving care or other health-related services |
| [Practitioner (§3.36)](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner) | Demographics and qualification information for an individual who is directly or indirectly involved in the provisioning of healthcare |
| [Organization (§3.33)](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization) | A formally or informally recognized grouping of people or organizations formed for the purpose of achieving some form of collective action. Includes companies, institutions, corporations, departments, community groups, healthcare practice groups, etc. |
| [Device (§3.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#device) | This resource identifies an instance of a manufactured thing that is used in the provision of healthcare without being substantially changed through that activity. The device may be a machine, an insert, a computer, an application, etc. This includes durable (reusable) medical equipment as well as disposable equipment used for diagnostic, treatment, and research for healthcare and public health. |
| [Group (§3.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#group) | Represents a defined collection of entities that may be discussed or acted upon collectively but which are not expected to act collectively and are not formally or legally recognized. I.e. A collection of entities that isn't an Organization |
| Visit | (Not defined yet) |
| [Location (§3.22)](http://hl7.org/implement/standards/fhir/fhir-book.htm#location) | Contact details and position information for a physical place that may be visited and where healthcare resources and participants may be found or contained, accommodated, or stored |
|  | |
| **Foundation** | |
| Resources that create infrastructure intended for wider reuse | |
| [List (§3.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#list) | A set of information summarized from a list of other resources |
| Category | (Not defined yet) |
| [Observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation) | Simple assertions and measurements made about a patient, device or other subject |
| [Supply (§3.45)](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply) | A supply - request and provision |
| [Substance (§3.44)](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance) | Substance |
| [Picture (§3.35)](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture) | An Image used in healthcare. The actual pixels maybe inline or provided by direct reference |
| [Provenance (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) | Provenance information associated with another resource that can be used to help determine its reliability or trace where the information in it came from. The focus of the provenance resource is record keeping, audit and traceability, not clinical meaning |
| [Questionnaire (§3.40)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire) | A set of answers to predefined lists of questions. The questions may be ordered and grouped into coherent subsets, corresponding to the structure of the grouping of the underlying questions. |
|  | |
| **Clinical** | |
| Focused on the content of the provider/patient encounter | |
| [AdverseReaction (§3.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction) | AdverseReaction |
| [AllergyIntolerance (§3.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance) | Allergy/Intolerance |
| [CarePlan (§3.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan) | Describes the intention of how one or more practitioners intend to deliver care for a particular patient for a period of time, possibly limited to care for a specific condition or set of conditions. |
| [FamilyHistory (§3.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory) | Significant health events and conditions for people related to the subject relevant in the context of care for the subject |
| [Immunization (§3.19)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization) | Immunization event information |
| [ImmunizationProfile (§3.20)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile) | A patient's point-of-time immunization status and recommendation with optional supporting justification |
| [Condition (§3.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition) | Use to record detailed information about conditions, problems or diagnoses recognized by a clinician. There are many uses including: recording a Diagnosis during an Encounter; populating a problem List or a Summary Statement, such as a Discharge Summary |
| [Procedure (§3.37)](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure) | An action that is performed on a patient. This can be a physical 'thing' like an operation, or less invasive like counselling or hypnotherapy |
|  | |
| **Medications** | |
| Pharmacy related medications | |
| [Medication (§3.24)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication) | This is primarily for identification and definition of Medication, but also covers ingredients and packaging |
| [MedicationPrescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription) | An order for both supply of the medication and the instructions for administration of the medicine to a patient. |
| [MedicationAdministration (§3.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration) | Describes the event of a patient being given a dose of a medication. This may be as simple as swallowing a tablet or it may be a long running infusion. Related resources tie this event to the authorizing prescription, and the specific encounter between patient and health care practitioner |
| [MedicationDispense (§3.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense) | Dispensing a medication to a named patient. This includes a description of the supply provided and the instructions for administering the medication. |
| [MedicationStatement (§3.28)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement) | A record of medication being taken by a patient, or that the medication has been given to a patient where the record is the result of a report from the patient, or another clinician |
|  | |
| **Diagnostics** | |
| Resources used in diagnostic service provision | |
| [DiagnosticReport (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport) | The findings and interpretation of diagnostic tests performed on patients and/or specimens. The report includes clinical context such as requesting and provider information, and some mix of atomic results, images, textual and coded interpretation, and formatted representation of diagnostic reports |
| [Specimen (§3.43)](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen) | Sample for analysis |
| [DiagnosticOrder (§3.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder) | A request for a diagnostic investigation service to be performed |
| [ImagingStudy (§3.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy) | Manifest of a set of images produced in study. The set of images may include every image in the study, or it may be an incomplete sample, such as a list of key images |
|  | |
| **Financial** | |
| Resources concerned with payments etc. | |
| [Coverage (§3.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage) | Financial instrument by which payment information for health care |
|  | |
| **Device Communications** | |
| Resources concerned with the process of communications between devices and clinical systems | |
| [DeviceObservation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation) | A set of observations produced by a device |
| [DeviceCapabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities) | Describes the set of data produced by a device |
| [DeviceLog (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) | A set of raw data produced by a device |
|  | |
| **Technical** | |
| Resources used to support exchange of other resources | |
| [Order (§3.31)](http://hl7.org/implement/standards/fhir/fhir-book.htm#order) | A request to perform an action |
| [OrderResponse (§3.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse) | A Response to an order |
| [SecurityEvent (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) | A record of an event made for purposes of maintaining a security log. Typical uses include detection of intrusion attempts and monitoring for inappropriate usage |
| [Document (§2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document) | A documentation of healthcare-related information that is assembled together into a single statement of meaning that establishes its own context. A document is composed of a set of resources that include both human and computer readable portions. A human may attest to the accuracy of the human readable portion and may authenticate and/or sign the entire whole. A document may be kept as a set of logically linked resources, or they may be bundled together in an atom feed |
| [OperationOutcome (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) | A collection of Error, warning or information messages that result from a system action |
| [Message (§2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message) | A transmission requesting action on a bundle of one or more resources or a response to such a request |
| [DocumentReference (§3.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference) | A reference to a document |
| [Binary](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.binary) | Pure Binary Content (Special) |
|  | |
| **Conformance** | |
| Related to the process of specifying application behaviour and resource usage | |
| [Conformance (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) | A conformance statement about how an application or implementation supports FHIR or the set of requirements for a desired implementation |
| [ValueSet (§3.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset) | A value set specifies a set of codes drawn from one or more code systems |
| [Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) | A Resource Profile - a statement of use of one or more FHIR Resources. It may include constraints on Resources and Data Types, Terminology Binding Statements and Extension Definitions |

## 3.1: Resource Definition: AdverseReaction

AdverseReaction.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /adversereaction/

Adverse Reaction resources are used to provide information about specific reactions to a substance. These are normally associated with an [AllergyIntolerance (§3.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance) resource, but can be reported on their own when no assumption of further reactions is being made, or when specific events are being described.

An Adverse Reaction normally has a set of sign or symptoms that are reported in the Symptom class. However, it is possible to convey that an adverse reaction occurred without knowing the specific signs or symptoms that occurred, eg. *Some unknown reaction occurred.* Similarly, it is possible to convey that an adverse reaction with a set of symptoms occurred but not indicate the substance if it is not known. eg. *A rash occurred for some unknown reason.*

The Exposure class is used to indicate a set of exposures that preceded the reaction. There is no assertion of causality, purely a statement of timing. Each exposure can indicate a substance that might be different from the reaction if needed.

### 3.1.1: Resource Content

See also the [Examples (§4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereactionEx) and the [Definitions (§5.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereactionDefn).

<[**AdverseReaction**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction) xmlns="http://hl7.org/fhir">

<[**reactionDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.reactionDate) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When the reaction occurred -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) The subject of the adverse reaction --></subject>

<[**didNotOccurFlag**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.didNotOccurFlag) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** To say that a reaction to substance did not occur -->

<[**recorder**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.recorder)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Who recorded the reaction --></recorder>

<[**symptom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.symptom)> <!-- **0..\*** The signs and symptoms that were observed as part of the reaction -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.symptom.code)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Indicates the specific sign or symptom that was observed (http://apps.who.int/classifications/icd10/browse/2010/en.htm)](http://apps.who.int/classifications/icd10/browse/2010/en.htm)  --></code>

<[**severity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.symptom.severity) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [The severity of the sign or symptom](http://hl7.org/implement/standards/fhir/fhir-book.htm#reactionSeverity) -->

</symptom>

<[**exposure**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.exposure)> <!-- **0..\*** An exposure to a substance that preceded a reaction occurrence -->

<[**exposureDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.exposure.exposureDate) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When the exposure occurred -->

<[**exposureType**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.exposure.exposureType) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [The type of exposure](http://hl7.org/implement/standards/fhir/fhir-book.htm#exposureType) -->

<[**causalityExpectation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.exposure.causalityExpectation) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [A statement of how confident that the recorder was that this exposure caused the reaction](http://hl7.org/implement/standards/fhir/fhir-book.htm#causalityExpectation) -->

<[**substance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-definitions.AdverseReaction.exposure.substance)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)) Substance(s) that is presumed to have caused the adverse reaction --></substance>

</exposure>

</AdverseReaction>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/adversereaction.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/adversereaction.profile.xml)

#### 3.1.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| AdverseReaction.symptom.code | The type of symptom. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [ICD-10 Reaction codes (http://apps.who.int/classifications/icd10/browse/2010/en)](http://apps.who.int/classifications/icd10/browse/2010/en) |
| AdverseReaction.symptom.severity | The severity of an adverse reaction. | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/reactionSeverity](http://hl7.org/implement/standards/fhir/fhir-book.htm#reactionSeverity) |
| AdverseReaction.exposure.exposureType | The type of exposure that resulted in an adverse reaction | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/exposureType](http://hl7.org/implement/standards/fhir/fhir-book.htm#exposureType) |
| AdverseReaction.exposure.causalityExpectation | How likely is it that the given exposure caused a reaction | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/causalityExpectation](http://hl7.org/implement/standards/fhir/fhir-book.htm#causalityExpectation) |

### 3.1.2: Notes:

* Vocabulary Bindings
  + The vocabulary bindings are tentative at this point. Further guidance is needed on whether the current bindings are reasonable.
  + ExposureType is currently a code, but if a suitable value set was used, it could (should?) be changed to a CodeableConcept.

### 3.1.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| date : date | the date of the reaction | AdverseReaction.reactionDate |
| subject : reference | The subject that the sensitivity is about | AdverseReaction.subject |
| substance : reference | The name or code of the substance that produces the sensitivity | AdverseReaction.exposure.substance |
| symptom : token | One of the symptoms of the reaction. | AdverseReaction.symptom.code |

## 3.2: Resource Definition: Alert

Prospective warnings of things that should be taken notice of when providing care to the patient.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /alert/

### 3.2.1: Resource Content

See also the [Examples (§4.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#alertEx) and the [Definitions (§5.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#alertDefn).

<[**Alert**](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-definitions.Alert) xmlns="http://hl7.org/fhir">

<[**category**](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-definitions.Alert.category)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) The category of this alert --></category>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-definitions.Alert.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [active | inactive | incorrect](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-status) -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-definitions.Alert.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Subject of this alert --></subject>

<[**author**](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-definitions.Alert.author)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Alert creator --></author>

<[**note**](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-definitions.Alert.note) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Text of alert -->

</Alert>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/alert.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/alert.profile.xml)

#### 3.2.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Alert.status | Indicates whether this alert is active and needs to be displayed to a user, or whether it is no longer needed or entered in error | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/alert-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-status) |

### 3.2.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| subject : reference | The identity of a subject to list alerts for | Alert.subject |

## 3.3: Resource Definition: AllergyIntolerance

Allergy/Intolerance.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /allergyintolerance/

Allergy/Intolerance resources are used to provide information about adverse sensitivities to substances that lead to physiologic changes that are clinically observable. An adverse sensitivity is defined as:

A condition expected to result in undesirable physiologic reaction to an amount of a substance that would not produce a reaction in most individuals. The substance is the trigger of an immunologic response that produces the observed physiologic changes, or in some instances non-immunologic mechanisms that produce clinically identical physiologic changes. The immunologic response might be considered the actual cause of the reaction, but it is exposure to the trigger substance that is clinically observable.

This definition excludes clinically identical episodes that may be caused by physical agents, such as heat, cold, sunlight, or vibration, by exercise activity, or by infectious agents. Those conditions caused by physical agents or infectious would be captured on the problem list ([List (§3.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#list)/[Condition (§3.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition) Resources). The allergy/intolerance list is a list of conditions that represent a propensity unique to this individual for a reaction upon future exposure to a specified substance.

Note that this specification draws a distinction between the patient’s condition/problem list and an allergy/intolerance list, even though allergies and intolerances are also conditions. This is because it is a long established clinical workflow, even to patients. Asking an individual "if they have any problems" is not going to invoke an account of their past reactions to medications or foods. Instead, they are asked if they "have any allergies". An allergy/intolerance is also different in that a potential harm from exposure to an external substance that may be ordered by a provider in the course of their care but is not inherent to exposure to that substance for the general population.

Most of the details of the sensitivity can be found in the set of [reactions (§3.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction) that are associated with the resource, though these may not be present when the patient has not provided enough information. [Adverse Reactions (§3.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction) do not have to be always associated with an AllergyIntolerance which may appropriate when an single reaction has not provided enough evidence for a meaningful Allergy/Intolerance, or in specific views of events rather than in a general clinical record.

### 3.3.1: Resource Content

See also the [Examples (§4.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintoleranceEx) and the [Definitions (§5.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintoleranceDefn).

<[**AllergyIntolerance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) An external identifier for the sensitivity --></identifier>

<[**criticality**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.criticality) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Criticality of the sensitivity](http://hl7.org/implement/standards/fhir/fhir-book.htm#criticality) -->

<[**sensitivityType**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.sensitivityType) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Type of the sensitivity](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitytype) -->

<[**recordedDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.recordedDate) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Date when the sensitivity was recorded -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Status of the sensitivity](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitystatus) -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Who the sensitivity is for --></subject>

<[**recorder**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.recorder)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Who recorded the sensitivity --></recorder>

<[**substance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.substance)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)) The substance that causes the sensitivity --></substance>

<[**reactions**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.reactions)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([AdverseReaction](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction.AdverseReaction)) Reactions associated with the sensitivity --></reactions>

<[**sensitivityTest**](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance-definitions.AllergyIntolerance.sensitivityTest)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation.Observation)) Observations that confirm or refute the sensitivity --></sensitivityTest>

</AllergyIntolerance>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/allergyintolerance.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/allergyintolerance.profile.xml)

#### 3.3.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| AllergyIntolerance.criticality | The criticality of an adverse sensitivity | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/criticality](http://hl7.org/implement/standards/fhir/fhir-book.htm#criticality) |
| AllergyIntolerance.sensitivityType | The type of an adverse sensitivity | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/sensitivitytype](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitytype) |
| AllergyIntolerance.status | The status of the adverse sensitivity | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/sensitivitystatus](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitystatus) |

### 3.3.2: Notes:

* Criticality vs. Severity

Criticality is defined as "The potential seriousness of a future reaction." This represents a clinical judgment about the worst case scenario for a future reaction. It would be based on the severity of past reactions, the dose and route of exposure that produced past reactions, and the life-threatening or organ system threatening potential of the reaction type. Criticality is an attribute of the allergic condition, not the reaction(s).

High criticality does not equate to a future severe reaction, but rather the potential for a severe and life-threatening reaction. Most reaction types are dose dependent, including anaphylaxis. Therefore, although they have a sensitivity of high criticality, exposure to a small dose of the substance to which they are sensitive might result in only a mild reaction. Severity of the reaction is also dependent on the route of exposure, but criticality since it applies to the condition, is not.

### 3.3.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| date : date | recorded date/time. | AllergyIntolerance.recordedDate |
| recorder : reference | who recorded the sensitivity | AllergyIntolerance.recorder |
| status : token | The status of the sensitivity | AllergyIntolerance.status |
| subject : reference | The subject that the sensitivity is about | AllergyIntolerance.subject |
| substance : reference | The name or code of the substance that produces the sensitivity | AllergyIntolerance.substance |
| type : token | The type of sensitivity | AllergyIntolerance.sensitivityType |

## 3.4: Resource Definition: CarePlan

Describes the intention of how one or more practitioners intend to deliver care for a particular patient for a period of time, possibly limited to care for a specific condition or set of conditions..

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /careplan/

Care Plans are used in many of areas of healthcare with a variety of scopes. They can be as simple as a general practitioner keeping track of when their patient is next due for a tetanus immunization through to a detailed plan for an oncology patient covering diet, chemotherapy, radiation, lab work and counselling with detailed timing relationships, pre-conditions and goals.

This resource takes an intermediate approach. It captures basic details about who is involved and what actions are intended without dealing in discrete data about dependencies and timing relationships. These can be supported where necessary using the extension mechanisms.

Comments are welcome about the appropriateness of the proposed level of granularity, whether it's too much detail for what most systems need, or not sufficient for common essential use cases.

### 3.4.1: Resource Content

See also the [Examples (§4.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplanEx) and the [Definitions (§5.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplanDefn).

<[**CarePlan**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) ID for plan --></identifier>

<[**patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.patient)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Who care plan is for --></patient>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [planned | active | ended](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-status) -->

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Time period plan covers --></period>

<[**modified**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.modified) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When last updated -->

<[**concern**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.concern)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Condition](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition.Condition)) Health issues plan addresses --></concern>

<[**participant**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.participant)> <!-- **0..\*** Who's involved in plan? -->

<[**role**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.participant.role)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Type of involvement --></role>

<[**member**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.participant.member)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[RelatedPerson](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson.RelatedPerson)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Who is involved --></member>

</participant>

<[**goal**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.goal)> <!-- **0..\*** Desired outcome of plan -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.goal.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** What's the desired outcome? -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.goal.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [in progress|achieved|sustaining | abandoned](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-goal-status) -->

<[**notes**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.goal.notes) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Comments about the goal -->

</goal>

<[**activity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity)> <!-- **0..\*** Action to occur as part of plan -->

<[**category**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.category) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [encounter | procedure | observation | +](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-category) -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Detail type of activity --></code>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [not started | ongoing | suspended | completed | abandoned](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-status) -->

<[**prohibited**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.prohibited) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** Do NOT do -->

<[**timing[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.timing_x_)><!-- **0..1** [Schedule](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule)|[Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period)|[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) When activity is to occur --></timing[x]>

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.location)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Where it should happen --></location>

<[**performer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.performer)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)|[RelatedPerson](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson.RelatedPerson)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Who's responsible? --></performer>

<[**product**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.product)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)|[Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)) What's administered/supplied --></product>

<[**dailyAmount**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.dailyAmount)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) How much consumed/day? --></dailyAmount>

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) How much is administered/supplied/consumed --></quantity>

<[**details**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.details) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Extra info on activity occurrence -->

<[**actionTaken**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.actionTaken)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Appointments, orders, etc. --></actionTaken>

<[**notes**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.activity.notes) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Comments about the activity -->

</activity>

<[**notes**](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan-definitions.CarePlan.notes) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Comments about the plan -->

</CarePlan>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/careplan.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/careplan.profile.xml)

#### 3.4.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| CarePlan.status | Indicates whether the plan is currently being acted upon, represents future intentions or is now just historical record. | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/care-plan-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-status) |
| CarePlan.participant.role | Indicates specific responsibility of an individual within the care plan. E.g. "Primary physician", "Team coordinator", "Caregiver", etc. | Unknown | No details provided yet |
| CarePlan.goal.status | Indicates whether the goal has been met and is still being targeted | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/care-plan-goal-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-goal-status) |
| CarePlan.activity.category | High-level categorization of the type of activity in a care plan. | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/care-plan-activity-category](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-category) |
| CarePlan.activity.code | Detailed description of the type of activity. E.g. What lab test, what procedure, what kind of encounter. | Unknown | No details provided yet |
| CarePlan.activity.status | Indicates where the activity is at in its overall life cycle | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/care-plan-activity-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-status) |

#### 3.4.1.2: Constraints

* On CarePlan.activity: Quantity can only be specified if activity category is supply (xpath on f:CarePlan/f:activity: (f:category/@value=('supply')) = exists(f:quantity))
* On CarePlan.activity: DailyDose can only be specified if activity category is drug or food (xpath on f:CarePlan/f:activity: (f:category/@value=('drug','diet')) = exists(f:dailyAmount))

### 3.4.2: Open Issues

* This resource combines the concepts of "Care Plan" and "Care Team" into a single resource. Is this appropriate?
* This specification leaves the specific relationship between activities in the care plan to textual description. Is more rigor required within the 80%?

### 3.4.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| activity : token | [CarePlan.activity.code] | CarePlan.activity.code |
| activitydate : date | Specified date occurs within period specified by CarePlan.activity.timingSchedule |  |
| condition : reference | [CarePlan.concern] | CarePlan.concern |
| date : date | [CarePlan.period] contains date | CarePlan.period |
| participant : reference | [CarePlan.participant.member] | CarePlan.participant.member |
| patient : reference | [CarePlan.patient] | CarePlan.patient |

## 3.5: Resource Definition: Condition

Use to record detailed information about conditions, problems or diagnoses recognized by a clinician. There are many uses including: recording a Diagnosis during an Encounter; populating a problem List or a Summary Statement, such as a Discharge Summary.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /condition/

This resource is used to record detailed information about a specific issue with the health state of a patient. It is intended for use for issues that have been identified as relevant for tracking and reporting purposes or where there's a need to capture a concrete diagnosis the gathering of data such as signs and symptoms. There are situations where the same information might appear as both an Observation as well as a condition. For example, the appearance of a rash or an instance of a fever are signs and symptoms that would typically be captured using the Observation resource. However, a pattern of ongoing fevers or a persistent or severe rash requiring treatment might be captured as a condition. The Condition resource specifically excludes AdverseReactions and AllergyIntolerances as those are handled with their own resources.

Conditions are frequently referenced by other resources as "reasons" for an action (Prescription, Procedure, DiagnosticOrder, etc.)

The conditions represented in this resources are sometimes described as "Problems", kept as part of a problem list.

### 3.5.1: Resource Content

See also the [Examples (§4.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conditionEx) and the [Definitions (§5.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conditionDefn).

<[**Condition**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition) xmlns="http://hl7.org/fhir">

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Subject of this condition --></subject>

<[**encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.encounter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)) Encounter during which the condition was first asserted --></encounter>

<[**asserter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.asserter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Person who asserts this condition --></asserter>

<[**dateAsserted**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.dateAsserted) value="[[date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date)]"/><!-- **0..1** When the first detected/suspected/entered -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.code)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Identification of the condition, problem or diagnosis](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-code) --></code>

<[**category**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.category)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [E.g. complaint | symptom | finding | diagnosis](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-category) --></category>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [provisional | working | confirmed | refuted](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-status) -->

<[**certainty**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.certainty)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Degree of confidence](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-certainty) --></certainty>

<[**severity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.severity)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Subjective severity of condition](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-severity) --></severity>

<[**onset[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.onset_x_)><!-- **0..1** [date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date)|[Age](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Age) Estimated or actual date, or age --></onset[x]>

<[**abatement[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.abatement_x_)><!-- **0..1** [date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date)|[Age](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Age)|[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean) If/when in resolution/remission --></abatement[x]>

<[**stage**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.stage)> <!-- **0..1** Stage/grade, usually assessed formally -->

<[**summary**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.stage.summary)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Simple summary (disease specific) --></summary>

<[**assessment**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.stage.assessment)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Formal record of assessment --></assessment>

</stage>

<[**evidence**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.evidence)> <!-- **0..\*** Supporting evidence -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.evidence.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Manifestation/symptom --></code>

<[**details**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.evidence.details)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Supporting information found elsewhere --></details>

</evidence>

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.location)> <!-- **0..\*** Anatomical location, if relevant -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.location.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Location - may include laterality --></code>

<[**details**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.location.details) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Precise location details -->

</location>

<[**relatedItem**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.relatedItem)> <!-- **0..\*** Causes or precedents for this Condition -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.relatedItem.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [due-to | follows](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-relationship-type) -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.relatedItem.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Relationship target by means of a predefined code](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-code) --></code>

<[**target**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.relatedItem.target)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Condition](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition.Condition)|[Procedure](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure.Procedure)|[Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)) Relationship target resource --></target>

</relatedItem>

<[**notes**](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-definitions.Condition.notes) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Additional information about the Condition -->

</Condition>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/condition.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/condition.profile.xml)

#### 3.5.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Condition.code | Identification of the Condition or diagnosis. | Example | [http://hl7.org/fhir/vs/condition-code (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-code) |
| Condition.category | A category assigned to the condition. E.g. finding | Condition | diagnosis | concern | condition | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/condition-category (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-category) |
| Condition.status | The clinical status of the Condition or diagnosis | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/condition-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-status) |
| Condition.certainty | The degree of confidence that this condition is correct | Example | [http://hl7.org/fhir/vs/condition-certainty (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-certainty) |
| Condition.severity | A subjective assessment of the severity of the condition as evaluated by the clinician. | Example | [http://hl7.org/fhir/vs/condition-severity (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-severity) |
| Condition.relatedItem.type | The type of relationship between a condition and its related item | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/condition-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-relationship-type) |
| Condition.relatedItem.code | Identification of issue that is a cause or a precedent of a Condition or diagnosis. | Example | [http://hl7.org/fhir/vs/condition-code (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-code) |

#### 3.5.1.2: Constraints

* On Condition.stage: Stage must have summary or assessment (xpath on f:Condition/f:stage: exists(f:summary) or exists(f:assessment))
* On Condition.evidence: evidence must have code or details (xpath on f:Condition/f:evidence: exists(f:code) or exists(f:details))
* On Condition.location: location must have code or details (xpath on f:Condition/f:location: exists(f:code) or exists(f:details))
* On Condition.relatedItem: Relationship must have either a code or a target (xpath on f:Condition/f:relatedItem: exists(f:code) != exists(f:target))

#### 3.5.1.3: Use of Condition.code

Many of the code systems used for coding Conditions will provide codes that define not only the condition itself, but may also specify a particular stage, location, or causality as part of the code. This is particularly true if SNOMED-CT is used for the condition, and especially if expressions are allowed.

When the Condition.code specifies addition properties of the condition, the other properties are not given a value - instead, the value must be understood from the condition.code.

### 3.5.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| asserter : reference | Person who asserts this condition | Condition.asserter |
| category : token | the category of the condition | Condition.category |
| code : token | code for the condition | Condition.code |
| dateAsserted : date | When the first detected/suspected/entered | Condition.dateAsserted |
| encounter : reference | Encounter during which the condition was first asserted | Condition.encounter |
| evidence : token | Manifestation/symptom | Condition.evidence.code |
| location : token | Location - may include laterality | Condition.location.code |
| onset : date | when the Condition started (if started on a date) | Condition.onset[x] |
| related-code : token | Relationship target by means of a predefined code | Condition.relatedItem.code |
| related-item : reference | Relationship target resource | Condition.relatedItem.target |
| severity : token | the severity of the condition | Condition.severity |
| stage : token | Simple summary (disease specific) | Condition.stage.summary |
| status : token | the status of the condition | Condition.status |
| subject : reference | Subject of this condition | Condition.subject |

## 3.6: Resource Definition: Conformance

A conformance statement about how an application or implementation supports FHIR or the set of requirements for a desired implementation.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /conformance/

Conformance Statements provide for a degree of automatic configuration and adaptation. However, capturing absolutely every variation that could impact the interoperability of two systems, let alone keeping that detailed information up-to-date as systems evolve through maintenance and upgrades is rarely practical. Therefore, conformance statements should be seen as an interim step. They provide a degree of automation. However, they also provide a great deal of human-readable content that can minimize the need for direct communication between the operators of the systems being configured to interoperate.

Conformance statements are used in one of three ways:

### 3.6.1: Describe an actual implementation

In this scenario, the conformance statement describes the capabilities of a deployed and configured solution available at a particular access point or set of access points. The statement describes exactly how to interface with that deployed solution and thus provides for a degree of self-configuration of software solutions.

This is the type of profile that FHIR restful solutions are expected to make available on invocation of the *conformance* operation. It is also the type of statement that forms a basis for the testing, certification or commissioning of specific software installations.

A conformance statement is identified as being an implementation statement through the presence of the *implementation* element.

### 3.6.2: Describe software solution capabilities

In this scenario, the conformance statement describes the generic capabilities of a software application or component solution. The solution might be available for purchase or other acquisition and might be deployed and configured at any number of independent sites. Because it is not dependent on any particular implementation, the profile cannot provide specific details such as endpoint addresses. It may also need to document various configurations in which the application can be set up or describe the degree of customizability associated with the solution.

This type of statement may be used as a marketing tool by software and system developers to formally describe their capabilities. It can also be used as the basis for conformance testing of software solutions independent of a particular installation.

A conformance statement is identified as being a software solution statement through the presence of the *software* element.

### 3.6.3: Describe a desired solution

In this scenario, the conformance statement describes the capabilities of a desired system. It might be used as part of an architectural design process to document needed system capabilities, or might be used as part of an RFP process to formally document the requirements of a requested solution and to document the criteria by which proposals will be evaluated.

A conformance statement is identified as being a requirements statement through the presence of the *proposal* element.

These three types of profiles can be used together. A requirements statement can be compared against the solution statements proffered by respondents to an RFP. A solution statement for a software package forms the starting point for the implementation statement associated with a particular installation of that software package.

### 3.6.4: Resource Content

See also the [Examples (§4.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformanceEx) and the [Definitions (§5.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformanceDefn).

<[**Conformance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.identifier) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Logical id to reference this statement § -->

<[**version**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.version) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Logical id for this version of the statement § -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Informal name for this conformance statement § -->

<[**publisher**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.publisher) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Publishing Organization § -->

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) Contacts for Organization § --></telecom>

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Human description of the conformance statement § -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [draft | experimental | review | production | withdrawn | superseded §](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-statement-status) -->

<[**experimental**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.experimental) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If for testing purposes, not real usage § -->

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** Publication Date § -->

<[**software**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.software)> <!-- **0..1** Software that is covered by this conformance statement § -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.software.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Name software is known by § -->

<[**version**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.software.version) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Version covered by this statement § -->

<[**releaseDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.software.releaseDate) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Date this version released § -->

</software>

<[**implementation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.implementation)> <!-- **0..1** If this describes a specific instance § -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.implementation.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Describes this specific instance § -->

<[**url**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.implementation.url) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Base URL for the installation § -->

</implementation>

<[**fhirVersion**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.fhirVersion) value="[[id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id)]"/><!-- **1..1** FHIR Version § -->

<[**acceptUnknown**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.acceptUnknown) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** True if application accepts unknown elements -->

<[**format**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.format) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..\*** [formats supported (xml | json | mime type) (http://www.rfc-editor.org/bcp/bcp13.txt.htm)](http://www.rfc-editor.org/bcp/bcp13.txt.htm)  -->

<[**rest**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest)> <!-- **0..\*** If the endpoint is a RESTful one -->

<[**mode**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.mode) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [client | server](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-conformance-mode) -->

<[**documentation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.documentation) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** General description of implementation -->

<[**security**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.security)> <!-- **0..1** Information about security of implementation -->

<[**service**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.security.service)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [What type of security services are supported/required](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-security-service) --></service>

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.security.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** General description of how security works -->

<[**certificate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.security.certificate)> <!-- **0..\*** Certificates associated with security profiles -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.security.certificate.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Mime type for certificate (http://www.rfc-editor.org/bcp/bcp13.txt.htm)](http://www.rfc-editor.org/bcp/bcp13.txt.htm)  -->

<[**blob**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.security.certificate.blob) value="[[base64Binary](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.base64Binary)]"/><!-- **0..1** Actual certificate -->

</certificate>

</security>

<[**resource**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource)> <!-- **1..\*** Resource served on the REST interface -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Resource type](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) -->

<[**profile**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.profile)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Profile](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.Profile)) Resource Profiles supported --></profile>

<[**operation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.operation)> <!-- **1..\*** What operations are supported? -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.operation.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [read | vread | update | etc.](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-operation) -->

<[**documentation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.operation.documentation) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Anything special about operation behavior -->

</operation>

<[**readHistory**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.readHistory) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Whether vRead can return past versions -->

<[**searchInclude**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.searchInclude) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** \_include values supported by the server -->

<[**searchParam**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.searchParam)> <!-- **0..\*** Additional search params defined -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.searchParam.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Name of search parameter -->

<[**source**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.searchParam.source) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Source of definition -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.searchParam.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Type of search parameter](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type) -->

<[**documentation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.searchParam.documentation) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Contents and meaning of search parameter -->

<[**target**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.searchParam.target) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..\*** [Types of resource (if a resource reference)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) -->

<[**chain**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.resource.searchParam.chain) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** Chained names supported -->

</searchParam>

</resource>

<[**batch**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.batch) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If batches are supported -->

<[**history**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.rest.history) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If a system wide history list is supported -->

</rest>

<[**messaging**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging)> <!-- **0..\*** If messaging is supported -->

<[**endpoint**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.endpoint) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Actual endpoint being described -->

<[**reliableCache**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.reliableCache) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Reliable Message Cache Length -->

<[**documentation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.documentation) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Messaging interface behavior details -->

<[**event**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.event)> <!-- **1..\*** Declare support for this event -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.event.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Event type](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-events) -->

<[**mode**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.event.mode) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [sender | receiver](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-conformance-event-mode) -->

<[**protocol**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.event.protocol)><!-- **0..\*** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) [http | ftp |MLLP | etc.](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-transport) --></protocol>

<[**focus**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.event.focus) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Resource that's focus of message](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) -->

<[**request**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.event.request)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Profile](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.Profile)) Profile that describes the request --></request>

<[**response**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.event.response)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Profile](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.Profile)) Profile that describes the response --></response>

<[**documentation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.messaging.event.documentation) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Endpoint-specific event documentation -->

</event>

</messaging>

<[**document**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.document)> <!-- **0..\*** Document definition -->

<[**mode**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.document.mode) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [producer | consumer](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-mode) -->

<[**documentation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.document.documentation) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Description of document support -->

<[**profile**](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-definitions.Conformance.document.profile)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Profile](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.Profile)) Constraint on a resource used in the document --></profile>

</document>

</Conformance>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/conformance.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/conformance.profile.xml)

#### 3.6.4.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Conformance.status | The status of this conformance statement | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/conformance-statement-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-statement-status) |
| Conformance.format Conformance.rest.security.certificate.type | The mime type of an attachment | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [BCP 13 (RFCs 2045, 2046, 2047, 4288, 4289 and 2049) (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) |
| Conformance.rest.mode | The mode of a restful conformance statement | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/restful-conformance-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-conformance-mode) |
| Conformance.rest.security.service | Types of security services used with FHIR | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/restful-security-service](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-security-service) |
| Conformance.rest.resource.type Conformance.rest.resource.searchParam.target Conformance.messaging.event.focus | One of the resource types defined as part of FHIR | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/resource-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) |
| Conformance.rest.resource.operation.code | Operations supported by REST | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/restful-operation](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-operation) |
| Conformance.rest.resource.searchParam.type | Data types allowed to be used for search parameters | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/search-param-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type) |
| Conformance.messaging.event.code | One of the message events defined as part of FHIR | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/message-events (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-events) |
| Conformance.messaging.event.mode | The mode of a message conformance statement | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/message-conformance-event-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-conformance-event-mode) |
| Conformance.messaging.event.protocol | How messages are delivered | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/message-transport](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-transport) |
| Conformance.document.mode | Whether the application produces or consumes documents | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/document-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-mode) |

#### 3.6.4.2: Constraints

* Must have at least one of description, software, or implementation (xpath: count(f:software | f:implementation | f:description) > 0)
* A Conformance profile must have at least one of rest, messaging or document (xpath: exists(f:rest) or exists(f:messaging) or exists(f:document))
* On Conformance.messaging: Messaging end point is required (and is only permitted) when statement is for an implementation (xpath on f:Conformance/f:messaging: exists(f:endpoint) = exists(parent::f:Conformance/f:implementation))

### 3.6.5: Notes:

* This conformance resource provides for an application to describe its use of the RESTful paradigm messaging events, or FHIR documents. Usually, an application would only describe one, but more than one may be described
* RESTful conformance rules:
  + RESTful servers are required to provide [this resource on demand (§2.1.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.conformance). Servers SHALL specify what resource types and operations are supported, and SHOULD also specify profiles for each resource type.
  + RESTful clients SHOULD publish a conformance statement
  + The search parameters that a server supports (or a client makes use of) are specified in the resource profile that the conformance statement references
  + Resource Types or operations that are not listed are not supported
* Messaging conformance rules:
  + The interpretation of request and response depends on the mode. If the mode is sender, then request specifies what the application sends, and response specifies what it accepts. If the mode is "receiver", then this is reversed
  + If a request or response is not specified for an event, then no rules are made for it
  + Events that are not listed are not supported
* Document conformance rules:
  + Document Profiles should directly constrain the Document.information.class and type elements so that there is no ambiguity concerning which profile any given document conforms to
* Other service based use of resources: Due to the variability of these services, the *Conformance* resource does not attempt to describe service based use of resources. The various service specifications will need to describe this usage in their own way

### 3.6.6: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| date : date | the conformance statement publication date | Conformance.date |
| event : token | event code in a conformance statement | Conformance.messaging.event.code |
| format : token | formats supported (xml | json | mime type) | Conformance.format |
| mode : token | mode - restful (server/client) or messaging (sender/receiver) | Conformance.rest.mode |
| profile : reference | a profile id invoked in a conformance statement | Conformance.rest.resource.profile |
| publisher : string | part of a publisher name | Conformance.publisher |
| resource : token | name of a resource mentioned in a conformance profile | Conformance.rest.resource.type |
| security : token | Information about security of implementation | Conformance.rest.security |
| software : string | part of a the name of a software application | Conformance.software.name |
| version : token | the version of FHIR | Conformance.version |

## 3.7: Resource Definition: Coverage

Financial instrument by which payment information for health care.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /coverage/

### 3.7.1: Resource Content

See also the [Examples (§4.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverageEx) and the [Definitions (§5.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverageDefn).

<[**Coverage**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage) xmlns="http://hl7.org/fhir">

<[**issuer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.issuer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) An identifier for the plan issuer --></issuer>

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Coverage start and end dates --></period>

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.type)><!-- **1..1** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) [Type of coverage (http://hl7.org/fhir/v3/vs/ActCoverageTypeCode.htm)](http://hl7.org/fhir/v3/vs/ActCoverageTypeCode.htm)  --></type>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) The primary coverage ID --></identifier>

<[**group**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.group)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) An identifier for the group --></group>

<[**plan**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.plan)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) An identifier for the plan --></plan>

<[**subplan**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.subplan)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) An identifier for the subsection of the plan --></subplan>

<[**dependent**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.dependent) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** The dependent number -->

<[**sequence**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.sequence) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** The plan instance or sequence counter -->

<[**subscriber**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.subscriber)> <!-- **0..1** Planholder information -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.subscriber.name)><!-- **0..1** [HumanName](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.HumanName) PolicyHolder name --></name>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.subscriber.address)><!-- **0..1** [Address](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address) PolicyHolder address --></address>

<[**birthdate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage-definitions.Coverage.subscriber.birthdate) value="[[date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date)]"/><!-- **0..1** PolicyHolder date of birth -->

</subscriber>

</Coverage>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/coverage.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/coverage.profile.xml)

#### 3.7.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Coverage.type | The type of insurance: public health, worker compensation; private accident, auto, private health, etc.) | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/v3/vs/ActCoverageTypeCode (http://hl7.org/fhirv3/ActCoverageTypeCode/index.htm)](http://hl7.org/fhirv3/ActCoverageTypeCode/index.htm) |

### 3.7.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| dependent : token | Dependent number | Coverage.dependent |
| group : token | Group identifier | Coverage.group |
| identifier : token | The primary identifier of the insured | Coverage.identifier |
| issuer : reference | The identity of the insurer | Coverage.issuer |
| name : token | The name of the subscriber | Coverage.subscriber.name |
| plan : token | A plan or policy identifier | Coverage.plan |
| sequence : token | Sequence number | Coverage.sequence |
| subplan : token | Sub-plan identifier | Coverage.subplan |
| type : token | The kind of coverage | Coverage.type |

## 3.8: Resource Definition: Device

This resource identifies an instance of a manufactured thing that is used in the provision of healthcare without being substantially changed through that activity. The device may be a machine, an insert, a computer, an application, etc. This includes durable (reusable) medical equipment as well as disposable equipment used for diagnostic, treatment, and research for healthcare and public health..

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /device/

This resource identifies an instance of a manufactured thing that is used in the provision of healthcare without being substantially changed through that activity. The device may be a machine, an insert, a computer, an application, etc. This includes durable (reusable) medical equipment as well as disposable equipment used for diagnostic, treatment, and research for healthcare and public health. Primarily used for recording which device performed an action and can also be used to track device location. Can also be used for prescribing and dispensing devices for patient use.

There are 4 device related resources

* Device (this resource) - an administrative resource that tracks individual devices and their location. Primarily used for attribution of actions to devices
* [Device Capabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities) - Defines what observations a device will provide when another device connects to it
* [Device Log (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) - A raw report from a device at a point in time. Must be paired with the correct Device Capabilities resource in order to be processed
* [Device Observation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation) - A report of observations from a device

The device capabilities and log resources are used when communicating with a device, either directly or indirectly. When a channel is opened with the device, or its proxy, it first sends the Capabilities resource, and then a series of log resources. The FHIR JSON format is used in this case.

The application that receives the log resources may choose to merge the log with the capabilities statement to create a device observation, which is suitable for wider use within a EHR/Clinical record context.

### 3.8.1: Resource Content

See also the [Examples (§4.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceEx) and the [Definitions (§5.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceDefn).

<[**Device**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device) xmlns="http://hl7.org/fhir">

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) What kind of device this is --></type>

<[**manufacturer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.manufacturer) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name of device manufacturer -->

<[**model**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.model) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Model id assigned by the manufacturer -->

<[**version**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.version) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Version number (i.e. software) -->

<[**expiry**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.expiry) value="[[date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date)]"/><!-- **0..1** Date of expiry of this device (if applicable) -->

<[**identity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.identity)> <!-- **0..1** Universal Device Id fields -->

<[**gtin**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.identity.gtin) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Global Trade Identification Number -->

<[**lot**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.identity.lot) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Lot number of manufacture -->

<[**serialNumber**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.identity.serialNumber) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Serial number assigned by the manufacturer -->

</identity>

<[**owner**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.owner)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Organization responsible for device --></owner>

<[**assignedId**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.assignedId)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identifier assigned by various organizations --></assignedId>

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.location)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Where the resource is found --></location>

<[**patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.patient)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) If the resource is affixed to a person --></patient>

<[**contact**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.contact)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) Details for human/organization for support --></contact>

<[**url**](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-definitions.Device.url) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Network address to contact device -->

</Device>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/device.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/device.profile.xml)

#### 3.8.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Device.type | Defines the nature of the device and the kind of functionality/services/behavior that may be expected from it | Unknown | No details provided yet |

### 3.8.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| assignedId : token | identifier assigned by the organisation | Device.assignedId |
| location : reference | Where the resource is found | Device.location |
| manufacturer : string | the manufacturer of the device | Device.manufacturer |
| model : string | the model of the device | Device.model |
| organization : reference | the organization responsible for the device | Device.owner |
| patient : reference | If the resource is affixed to a person | Device.patient |
| serial : string | the serial number of the device | Device.identity.serialNumber |
| type : token | the type of the device | Device.type |

## 3.9: Resource Definition: DeviceCapabilities

Describes the set of data produced by a device.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /devicecapabilities/

There are 4 device related resources

* [Device (§3.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#device) - An administrative resource that tracks individual devices and their location. Primarily used for attribution of actions to devices
* Device Capabilities (this resource) - Defines what observations a device will provide when another device connects to it
* [Device Log (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) - A raw report from a device at a point in time. Must be paired with the correct Device Capabilities resource in order to be processed
* [Device Observation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation) - A report of observations from a device

The device capabilities and log resources are used when communicating with a device, either directly or indirectly. When a channel is opened with the device, or its proxy, it first sends the Capabilities resource, and then a series of log resources. The FHIR JSON format is used in this case. (TODO: What's the communication protocol?) The application that receives the log resources may choose to merge the log with the capabilities statement to create a device observation, which is suitable for wider use within a EHR/Clinical record context. The Device Capabilities and Device Log resources may be used in a RESTful context, but in many contexts this will not be very useful - the data should be converted to a device observation for normal RESTful use in a patient care context.

Note that this resource is entirely concerned with devices that report data; interacting with and controlling devices such as infusion pumps etc. is not in scope for this resource (no solution for this yet). This resource is based on ISO 11073.

#### 3.9.0.1: Structure of the Device Capabilities

A medical device is conceived of as a measuring device that is capable of reporting a series of groups of measurements on a regular basis. The device capabilities resource describes the kind of data that a medical device reports. Devices are conceptualised using the following main structure:

1. **Device** - The actual device that external systems communicate with
2. **Virtual Medical Device** - A medical-related subsystem of a medical device. The virtual device that may be part of the containing device, or a separate device that may be communicating with it
3. **Channel** - Groups together physiological measurement data and derived data
4. **Metrics** - A piece of measured or derived data that will be reported by the machine
5. **Facets** - Additional data that qualifies the metric, or contributes to its assessment

Very simple devices may have only a single compartment with a single channel and one metric, while complex devices may have multiple items at every level.

When the [data emitted by the device (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) is converted to a [Device Observation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation) based on the information in the capabilities, and known local context, the Metrics level usually corresponds to a single [Observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation), but this is not appropriate in all cases.

### 3.9.1: Resource Content

See also the [Examples (§4.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilitiesEx) and the [Definitions (§5.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilitiesDefn).

<[**DeviceCapabilities**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities) xmlns="http://hl7.org/fhir">

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** The name of this device -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.type)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) The type of device --></type>

<[**manufacturer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.manufacturer) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Company that built the device -->

<[**identity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.identity)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Identifies this particular device uniquely --></identity>

<[**virtualDevice**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice)> <!-- **0..\*** A medical-related subsystem of a medical device -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Describes the compartment --></code>

<[**channel**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel)> <!-- **0..\*** Groups related data items -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Describes the channel --></code>

<[**metric**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric)> <!-- **0..\*** Piece of data reported by device -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.code)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Describes the metrics --></code>

<[**key**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.key) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Used to link to data in device log -->

<[**info**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.info)> <!-- **1..1** How to interpret this metric value -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.info.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Quantity | Coding | Array | string](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-data-type) -->

<[**units**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.info.units) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Human Readable units of data value -->

<[**ucum**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.info.ucum) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [UCUM units for data value (http://unitsofmeasure.org.htm)](http://unitsofmeasure.org.htm/)  -->

<[**template**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.info.template)><!-- **0..1** [SampledData](http://hl7.org/implement/standards/fhir/fhir-book.htm#sampleddata.SampledData) Array template (fixed values) --></template>

<[**system**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.info.system) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** System for coding -->

</info>

<[**facet**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.facet)> <!-- **0..\*** Additional clarifying or qualifying data -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.facet.code)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Describes the facet (http://loinc.org.htm)](http://loinc.org.htm/)  --></code>

<[**scale**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.facet.scale) value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **0..1** Factor to apply to raw values (default = 1) -->

<[**key**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.facet.key) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Used to link to data in device log -->

<[**info**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities-definitions.DeviceCapabilities.virtualDevice.channel.metric.facet.info)><!-- **1..1** Content as for DeviceCapabilities.virtualDevice.channel.metric.info How to interpret this facet value --></info>

</facet>

</metric>

</channel>

</virtualDevice>

</DeviceCapabilities>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/devicecapabilities.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/devicecapabilities.profile.xml)

#### 3.9.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| DeviceCapabilities.type | Defines the nature of the device and the kind of functionality/services/behavior that may be expected from it | Unknown | No details provided yet |
| DeviceCapabilities.virtualDevice.code | Describes the compartment | Unknown | No details provided yet |
| DeviceCapabilities.virtualDevice.channel.code | Describes the channel | Unknown | No details provided yet |
| DeviceCapabilities.virtualDevice.channel.metric.code | Describes the metrics | Unknown | No details provided yet |
| DeviceCapabilities.virtualDevice.channel.metric.info.type | The type of data produced by a device | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/device-data-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-data-type) |
| DeviceCapabilities.virtualDevice.channel.metric.info.ucum | UCUM Codes | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://unitsofmeasure.org](http://unitsofmeasure.org/) |
| DeviceCapabilities.virtualDevice.channel.metric.facet.code | Describes the facet | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://loinc.org](http://loinc.org/) |

#### 3.9.1.2: Constraints

* On DeviceCapabilities.virtualDevice.channel.metric.info: If the type is "Quantity", ucum must be provided (xpath on f:DeviceCapabilities/f:virtualDevice/f:channel/f:metric/f:info: ((f:type/@value = 'Quantity') and (f:ucum)) or ((f:type/@value != 'Quantity') and not (f:ucum)))
* On DeviceCapabilities.virtualDevice.channel.metric.info: If the type is "Coding', system must be provided (xpath on f:DeviceCapabilities/f:virtualDevice/f:channel/f:metric/f:info: (f:type/@value != 'Coding') or f:system)
* On DeviceCapabilities.virtualDevice.channel.metric.info: If the type is "Quantity", units must be provided (xpath on f:DeviceCapabilities/f:virtualDevice/f:channel/f:metric/f:info: ((f:type/@value = 'Quantity') and (f:units)) or (not (f:type/@value != 'Quantity') and not (f:units)))
* On DeviceCapabilities.virtualDevice.channel.metric.info: If the type is "SampledData", an sampling template must be provided (xpath on f:DeviceCapabilities/f:virtualDevice/f:channel/f:metric/f:info: ((f:type/@value = 'SampledData') and (f:template)) or ((f:type/@value != 'SampledData') and not (f:template)))

#### 3.9.1.3: Usage Notes

* In very simple devices, the device capabilities will be fixed for every device. In particular, there will be no identity reference. With devices such as these, the system receiving the data must be aware of the device identity etc. so that data can be interpreted correctly. More sophisticated machines may identify themselves as part of their capabilities declaration.
* The device log resource uses the key values on the metric and facet elements to link a piece of data to the correct information that defines how to interpret it. This process is discussed in detail on the [Device Log (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) resource.

### 3.9.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| channel : token | The channel code | DeviceCapabilities.virtualDevice.channel.code |
| code : token | The compartment code | DeviceCapabilities.virtualDevice.code |
| datatype : token | Quantity | Coding | Array | string | DeviceCapabilities.virtualDevice.channel.metric.info.type |
| facet : token | The facet code | DeviceCapabilities.virtualDevice.channel.metric.facet.code |
| identity : reference | Identifies this particular device uniquely | DeviceCapabilities.identity |
| manufacturer : token | Company that built the device | DeviceCapabilities.manufacturer |
| metric : token | The metric code | DeviceCapabilities.virtualDevice.channel.metric.code |
| name : string | The name of this device | DeviceCapabilities.name |
| type : token | The type of device | DeviceCapabilities.type |

## 3.10: Resource Definition: DeviceLog

A set of raw data produced by a device.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /devicelog/

There are 4 device related resources

* [Device (§3.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#device) - an administrative resource that tracks individual devices and their location. Primarily used for attribution of actions to devices
* [Device Capabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities) - Defines what observations a device will provide when another system connects to it
* Device Log (this resource) - A raw report from a device at a point in time. Must be paired with the correct Device Capabilities resource in order to be processed
* [Device Observation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation) - A report of observations from a device

The device capabilities and log resources are used when communicating with a device, either directly or indirectly. When a channel is opened with the device, or its proxy, it first sends the Capabilities resource, and then a series of log resources. The FHIR JSON format is used in this case. (TODO: What's the communication protocol?) The application that receives the log resources may choose to merge the log with the capabilities statement to create a device observation, which is suitable for wider use within a EHR/Clinical record context. The application that receives the log resources may choose to merge the log with the capabilities statement to create a device observation, which is suitable for wider use within a EHR/Clinical record context. The Device Capabilities and Device Log resources may be used in a RESTful context, but in many contexts this will not be very useful - the data should be converted to a Device Observation for normal RESTful use in a patient care context.

#### 3.10.0.1: Structure of the Device Log

A medical device emits a series of these device log resources on a regular basis. A device log is simply a list of items with a key, a value, and a set of flags. The only way to understand the contents of the resource is to match the device log to the device capabilities that provides the context for interpreting the data in the device log. The device log can identify the appropriate [Device Capabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities) resource explicitly, but generally this is omitted, and the applicable resource is the one that is sent prior to any device log resources being sent. The system receiving the data must keep track of the appropriate [Device Capabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities) resource.

Some devices may be configured to know the identity of the subject of the observations, so the device log also includes the subject. However many simple devices do not know the identity of the subject well, or even at all, and the subject information must be provided or completed by the recipient of the device logs based on local context.

The device log is a low level resource suitable for direct communication with devices. The data from the device is usually converted to a [Device Observation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation) for general use in a patient care context. This process is described further below.

### 3.10.1: Resource Content

See also the [Examples (§4.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelogEx) and the [Definitions (§5.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelogDefn).

<[**DeviceLog**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog-definitions.DeviceLog) xmlns="http://hl7.org/fhir">

<[**instant**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog-definitions.DeviceLog.instant) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **0..1** When the data values are reported -->

<[**capabilities**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog-definitions.DeviceLog.capabilities)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([DeviceCapabilities](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities.DeviceCapabilities)) Explicit reference to the capabilities --></capabilities>

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog-definitions.DeviceLog.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Subject of the measurement --></subject>

<[**item**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog-definitions.DeviceLog.item)> <!-- **0..\*** An item of data -->

<[**key**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog-definitions.DeviceLog.item.key) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Reference to device capabilities declaration -->

<[**value**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog-definitions.DeviceLog.item.value) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** The value of the data item, if available -->

<[**flag**](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog-definitions.DeviceLog.item.flag) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..\*** [Information about the quality of the data etc.](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "device-value-flag) -->

</item>

</DeviceLog>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/devicelog.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/devicelog.profile.xml)

#### 3.10.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| DeviceLog.item.flag | Flags that supply information about the status of a device reading | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/device-value-flag](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-value-flag) |

#### 3.10.1.2: Converting Device Logs to Device Observations

A device log has little context, and does not have the full context to support integrating the data into the patient record. The usual process for feeding the data from the device log resource into the patient record is to convert it to a [Device Observation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation).

To convert the data from a Device Log to a Device Observation:

* Locate the matching Device Capabilities resource (may be referred to explicitly in the log, but is also sent explicitly by the machine each time a system connects to it)
* Use the key values on the device log to identify the relevant metric or facet for each item
* Use the information for the metric or facet to build a set of [observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation) resources (see below)
* Create a device observation that provides the device context for the observations
* Fill out the missing information (device identity, subject, etc.). This information may be explicit in the device capabilities and device log resources, but the simpler the device, the more likely it must come from local context/configuration
* Submit the device observation to the patient record

**Converting a Data Item to an Observation**

Between the Device Item and the matching Device Capabilities information, the following information is provided:

* metric or facet code - the code for the observation
* data item value
* data type
* additional information to complete the data type
* a set of flags

The following table describes how to convert from value to the correct data type:

|  |  |  |
| --- | --- | --- |
| **Data Type** | **Description** | **Template** |
| [Quantity (§1.4.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) | The common case. The device capabilities provides a units, and optionally a UCUM code | <valueQuantity>  <value value="[data item value]" />  [ (if appropriate from flags) <comparator value="??" /> ]  <units value="[units]" />  [ (if UCUM code provided)  <system value="http://unitsofmeasure.org" />  <code value="[UCUM]" />  ]  </valueQuantity> |
| [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) | When the output is a choice of one of a set of discrete values. The system should be a reference to some locatable definition of the values so that display names can be resolved | <valueCoding>  <system value="[system]" />  <code value="[data item value]" />  </valueCoding> |
| [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) | The output should be treated as a simple string | <valueString value="[data item value]"/> |

The following table summarizes the interpretation of the possible flags

|  |  |
| --- | --- |
| **Flag** | **Interpretation** |
| ok, ongoing, early, questionable, calibrating, error, unknown | The flags have the same meaning on the observation.reliability element |
| test, demo, alarm, alarm-off | These flags have no representation in the observation resource |
| under, over | These flags map to the Quantity.comparator element |

Generally, as a rule of thumb, metrics and facets are components of the observation.

### 3.10.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| capabilities : reference | Explicit reference to the capabilities | DeviceLog.capabilities |
| flag : token | Information about the quality of the data etc. | DeviceLog.item.flag |
| instant : date | When the data values are reported | DeviceLog.instant |
| key : token | Reference to device capabilities declaration | DeviceLog.item.key |
| subject : reference | Subject of the measurement | DeviceLog.subject |
| value : token | The value of the data item, if available | DeviceLog.item.value |

## 3.11: Resource Definition: DeviceObservation

A set of observations produced by a device.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /deviceobservation/

There are 4 device related resources

* [Device (§3.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#device) - an administrative resource that tracks individual devices and their location. Primarily used for attribution of actions to devices
* [Device Capabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities) - Defines what observations a device will provide when another device connects to it
* [Device Log (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) - A raw report from a device at a point in time. Must be paired with the correct Device Capabilities resource in order to be processed
* Device Observation (this resource) - A report of observations from a device

The device capabilities and log resources are used when communicating with a device, either directly or indirectly. When a channel is opened with the device, or its proxy, it first sends the Capabilities resource, and then a series of log resources. The FHIR JSON format is used in this case. The application that receives the log resources may choose to merge the log with the capabilities statement to create a device observation, which is suitable for wider use within a EHR/Clinical record context.

#### 3.11.0.1: Structure of the Device Observation

The Device Observation is a simple wrapper that groups a set of actual observations together and extracts the common elements that are the same for all of them. In addition, the DeviceObservation resource has some additional attribution and context information.

### 3.11.1: Resource Content

See also the [Examples (§4.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservationEx) and the [Definitions (§5.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservationDefn).

<[**DeviceObservation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation-definitions.DeviceObservation) xmlns="http://hl7.org/fhir">

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation-definitions.DeviceObservation.code)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Type of device observation --></code>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation-definitions.DeviceObservation.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identifiers assigned to this observation --></identifier>

<[**issued**](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation-definitions.DeviceObservation.issued) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **1..1** Date the measurements were made -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation-definitions.DeviceObservation.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) The subject of the measurements --></subject>

<[**device**](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation-definitions.DeviceObservation.device)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Device that produced the results --></device>

<[**measurement**](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation-definitions.DeviceObservation.measurement)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation.Observation)) Actual measurements --></measurement>

</DeviceObservation>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/deviceobservation.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/deviceobservation.profile.xml)

### 3.11.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| code : token | Type of device observation | DeviceObservation.code |
| device : reference | Device that produced the results | DeviceObservation.device |
| identifier : token | Identifiers assigned to this observation | DeviceObservation.identifier |
| issued : date | Date the measurements were made | DeviceObservation.issued |
| measurement : reference | Actual measurements | DeviceObservation.measurement |
| subject : reference | The subject of the measurements | DeviceObservation.subject |

## 3.12: Resource Definition: DiagnosticOrder

A request for a diagnostic investigation service to be performed.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /diagnosticorder/

A *Diagnostic Order* is a record of a request for a set of diagnostic investigations to be performed. The investigation will lead to a [Diagnostic Report (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport) that summarizes the outcome of the investigation, and includes any useful data and/or images that are relevant to the treatment/management of the subject.

The principal intention of the *Diagnostic Order* is to support ordering diagnostic investigations on patients (which includes non-human patients in veterinary medicine. However in many contexts, healthcare related processes include performing diagnostic investigations on groups of subjects, devices involved in the provision of healthcare, and even environmental locations such as ducts, bodies of water, etc. The *Diagnostic Order* supports all these usages.

The general work flow that this resource facilitates is that a clinical system creates a diagnostic order. The diagnostic order is then exchanged, perhaps via intermediaries, with a system that represents a diagnostic service that can perform the investigation as a request to do so. The diagnostic service will update the request as the work is performed, and then finally issue a report that references the requests that it fulfills.

Note that the Diagnostic Order itself is not a request to perform the investigation - it is just a record of the fact that a request was made. The Diagnostic Request must be paired with an [Order (§3.31)](http://hl7.org/implement/standards/fhir/fhir-book.htm#order) resource to convey the actual instruction, or part of an explicit messaging or service workflow that carries the instruction.

### 3.12.1: Resource Content

See also the [Examples (§4.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorderEx) and the [Definitions (§5.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorderDefn).

<[**DiagnosticOrder**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder) xmlns="http://hl7.org/fhir">

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who/what test is about --></subject>

<[**orderer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.orderer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who ordered the test --></orderer>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identifiers assigned to this order --></identifier>

<[**encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.encounter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)) The encounter that this diagnostic order is associated with --></encounter>

<[**clinicalNotes**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.clinicalNotes) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Explanation/Justification for test -->

<[**specimen**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.specimen)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Specimen](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen.Specimen)) If the whole order relates to specific specimens --></specimen>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [requested | received | accepted | inprogress | review | complete | suspended | rejected | failed](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) -->

<[**event**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.event)> <!-- **0..\*** A list of events of interest in the lifecycle -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.event.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [requested | received | accepted | inprogress | review | complete | suspended | rejected | failed](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) -->

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.event.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** The date at which the event happened -->

<[**actor**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.event.actor)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who recorded or did this --></actor>

</event>

<[**item**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.item)> <!-- **0..\*** The items the orderer requested -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.item.code)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Code for this item](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-requests) --></code>

<[**specimen**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.item.specimen)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Specimen](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen.Specimen)) If this item relates to specific specimens --></specimen>

<[**bodySite**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.item.bodySite)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Location of requested test (if applicable)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) --></bodySite>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.item.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [requested | received | accepted | inprogress | review | complete | suspended | rejected | failed](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) -->

<[**event**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder-definitions.DiagnosticOrder.item.event)><!-- **0..\*** Content as for DiagnosticOrder.event Events specific to this item --></event>

</item>

</DiagnosticOrder>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/diagnosticorder.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/diagnosticorder.profile.xml)

#### 3.12.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| DiagnosticOrder.status DiagnosticOrder.event.status DiagnosticOrder.item.status | The status of a diagnostic order | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/diagnostic-order-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) |
| DiagnosticOrder.item.code | codes for tests/services that can be performed by diagnostic services | Example | [http://hl7.org/fhir/vs/diagnostic-requests (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-requests) |
| DiagnosticOrder.item.bodySite | Codes describing anatomical locations. May include laterality | Example | [http://hl7.org/fhir/vs/body-site (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) |

### 3.12.2: Notes:

* In normal practice, there would always be at least one item in a request (no point requesting nothing), but the minimum cardinality is 0 so that a workflow can quote order details (identifiers, requester) without having to list the items
* Typically the system placing the order sets the status to requested. Thereafter, the order is maintained by the receiver that updates the status as the request is processed
* If the request has multiple items that have their own life cycles, then the items will have their own status while the overall diagnostic order is (usually) "in progress"
* The event list is not the same as an audit trail - it is a view of the important things that happened in the past. Typically, there would only be one entry for any given status, and systems may not record all the status events
* Many investigation requests will create a need for specimens, but the in these cases, the request itself is not actually about the specimens. This specimen elements in this resource are provided for when the diagnostic investigation is requested on already existing specimens
* A single specimen should not appear in both DiagnosticOrder.specimen and DiagnosticOrder.item.specimen
* The clinical notes may be used to decide how the diagnostic investigation will be performed, or even if it will be performed at all

### 3.12.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| actor : reference | Who recorded or did this | DiagnosticOrder.event.actor, DiagnosticOrder.item.event.actor |
| bodysite : token | Location of requested test (if applicable) | DiagnosticOrder.item.bodySite |
| code : token | Code for this item | DiagnosticOrder.item.code |
| date : date | The date at which the event happened | DiagnosticOrder.event.date |
| encounter : reference | The encounter that this diagnostic order is associated with | DiagnosticOrder.encounter |
| identifier : token | Identifiers assigned to this order | DiagnosticOrder.identifier |
| item-date : date | The date at which the event happened | DiagnosticOrder.item.event.date |
| item-past-status : token | requested | received | accepted | inprogress | review | complete | suspended | rejected | failed | DiagnosticOrder.item.event.status |
| item-status : token | requested | received | accepted | inprogress | review | complete | suspended | rejected | failed | DiagnosticOrder.item.status |
| item-status-date : composite | A combination of item-past-status and item-date |  |
| orderer : reference | Who ordered the test | DiagnosticOrder.orderer |
| past-status : token | requested | received | accepted | inprogress | review | complete | suspended | rejected | failed | DiagnosticOrder.event.status |
| specimen : reference | If the whole order relates to specific specimens | DiagnosticOrder.specimen, DiagnosticOrder.item.specimen |
| status : token | requested | received | accepted | inprogress | review | complete | suspended | rejected | failed | DiagnosticOrder.status |
| status-date : composite | A combination of past-status and date |  |
| subject : reference | Who/what test is about | DiagnosticOrder.subject |

## 3.13: Resource Definition: DiagnosticReport

The findings and interpretation of diagnostic tests performed on patients and/or specimens. The report includes clinical context such as requesting and provider information, and some mix of atomic results, images, textual and coded interpretation, and formatted representation of diagnostic reports.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /diagnosticreport/

A diagnostic report is used for the set of information that is typically provided by a diagnostic service when investigations are complete. The information includes a mix of atomic results, text reports, images, and codes. The mix varies depending on the nature of the diagnostic procedure, and sometimes on the nature of the outcomes for a particular investigation.

The Diagnostic Report Resource is suitable for the following kinds of Diagnostic Reports:

* Laboratory (Clinical Chemistry, Hematology, Microbiology, etc.)
* Pathology / Histopathology / related disciplines
* Imaging Investigations (x-ray, CT, MRI etc.)
* Other diagnostics - Cardiology, Gastroenterology etc.

The Diagnostic Report is not intended to support:

* Cumulative Result presentation
* Genetic Sequencing and related reports

Comments on the suitability of this resource and/or requirements analysis for that would be welcome through the community input above.

The actual atomic result data are delegated to the [common Observation Resource (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation) to make it easier to reuse them in a wider context.

There is a wide variety of names associated with the various parts of a diagnostic report. Doctors request for "tests" or "results" to be done. What the diagnostic service returns is variously called the "tests" or "results" or the "report". The individual data items are called "results" or "tests" both collectively and individually. Collections of individual data items are sometimes called "batteries" or "panels", which have various implications in different contexts. The naming confusion is worsened because of the wide variety of forms that the result of a diagnostic investigation can take, as described above. Languages other than English have their own variations on this theme.

This resource uses one particular set of terms. A practitioner "requests" a set of "tests". The diagnostic service returns a "report" which contains a "narrative" - a written summary of the outcomes, and "results" - the individual pieces of atomic data. The results are assembled in a "group" which is a nested structure that can be used to define relationships between the individual data items.

### 3.13.1: Resource Content

See also the [Examples (§4.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreportEx) and the [Definitions (§5.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreportDefn).

<[**DiagnosticReport**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport) xmlns="http://hl7.org/fhir">

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [registered|interim|final|amended|cancelled|withdrawn §](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) -->

<[**issued**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.issued) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** Date this version was released § -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) The subject of the report § --></subject>

<[**performer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.performer)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Responsible Diagnostic Service § --></performer>

<[**reportId**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.reportId)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Id for external references to this report § --></reportId>

<[**requestDetail**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.requestDetail)> <!-- **0..\*** What was requested -->

<[**encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.requestDetail.encounter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)) Context where request was made --></encounter>

<[**requestOrderId**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.requestDetail.requestOrderId)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Id assigned by requester --></requestOrderId>

<[**receiverOrderId**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.requestDetail.receiverOrderId)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Receiver's Id for the request --></receiverOrderId>

<[**requestTest**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.requestDetail.requestTest)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Test Requested](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-requests) --></requestTest>

<[**bodySite**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.requestDetail.bodySite)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Location of requested test (if applicable)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) --></bodySite>

<[**requester**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.requestDetail.requester)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)|[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Responsible for request --></requester>

<[**clinicalInfo**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.requestDetail.clinicalInfo) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Clinical information provided -->

</requestDetail>

<[**serviceCategory**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.serviceCategory)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Biochemistry, Haematology etc. §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-service-sections) --></serviceCategory>

<[**diagnosticTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.diagnosticTime) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** Effective time of diagnostic report § -->

<[**results**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.results)> <!-- **1..1** Results grouped by specimen/kind/category -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.results.name)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Name/Code for this group of results](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-report-names) --></name>

<[**specimen**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.results.specimen)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Specimen](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen.Specimen)) Specimen details for this group --></specimen>

<[**group**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.results.group)><!-- **0..\*** Content as for DiagnosticReport.results Nested Report Group --></group>

<[**result**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.results.result)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation.Observation)) An atomic data result --></result>

</results>

<[**image**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.image)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Picture](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture.Picture)|[ImagingStudy](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy.ImagingStudy)) Key images associated with this report --></image>

<[**conclusion**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.conclusion) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Clinical Interpretation of test results -->

<[**codedDiagnosis**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.codedDiagnosis)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Codes for the conclusion](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-clinical-findings) --></codedDiagnosis>

<[**representation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-definitions.DiagnosticReport.representation)><!-- **0..\*** [Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) Entire Report as issued --></representation>

</DiagnosticReport>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/diagnosticreport.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/diagnosticreport.profile.xml)

#### 3.13.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| DiagnosticReport.status | Codes providing the status of an observation | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/observation-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) |
| DiagnosticReport.requestDetail.requestTest | codes for tests/services that can be performed by diagnostic services | Example | [http://hl7.org/fhir/vs/diagnostic-requests (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-requests) |
| DiagnosticReport.requestDetail.bodySite | Codes describing anatomical locations. May include laterality | Example | [http://hl7.org/fhir/vs/body-site (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) |
| DiagnosticReport.serviceCategory | codes for diagnostic service sections | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/diagnostic-service-sections (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-service-sections) |
| DiagnosticReport.results.name | DiagnosticResultGroupNames | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/report-names (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-report-names) |
| DiagnosticReport.codedDiagnosis | Diagnoses codes provided as adjuncts to the report | Example | [http://hl7.org/fhir/vs/clinical-findings (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-clinical-findings) |

### 3.13.2: Notes:

* This resource includes some elements that relate to the ordering cycle (request identifiers); these are only included to the degree that it is useful for the final report to refer back to the orders. For explicit support of the ordering cycle, see the Order, OrderResponse, and DiagnosticOrder resources.
* If the diagnostic procedure was performed on the patient directly, *diagnosticTime* is the time it was performed. If specimens were taken, the diagnostically relevant time can be derived from the specimen collection times, but since the specimen information is not always available, and nor is the exact relationship always automatic, the reports must always include a *diagnosticTime* element.
* A report always contains a base group for individual results. As a minimum, this contains the name of the report itself. The base group can then contain a mix of results and sub-groups. The group has a code that indicates the nature of the grouping (e.g. organism isolate/sensitivity or antibody functional testing).
* There is rarely a need for more than two levels of groups. Known uses of 3 levels include the antibody code for a group of antibody related test, or the organism code for a group of isolate/sensitivities, or a set of perinatal measurements on a single fetus.
* Applications consuming diagnostic reports must take careful note of updates to them, and particularly note withdrawn reports.
* For applications providing diagnostic reports, a report shouldn't be final until all the individual data items reported with it are final or amended. If a report is withdrawn, all the results should be withdrawn by replacing every result value with the Concept "withdrawn" in the internal terminology ["Special values"](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies) (url = "http://hl7.org/fhir/special-values"), and setting the conclusion (if provided) and the text narrative to some text like "This report has been withdrawn" in the appropriate language. A reason for withdrawal may be provided in the narrative.

### 3.13.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| code : token | a coded diagnosis on the report | DiagnosticReport.codedDiagnosis |
| date : date | the clinically relevant time of the report | DiagnosticReport.diagnosticTime |
| group : token | name /code of a group in the report |  |
| identifier : token | an identifier for the report | DiagnosticReport.reportId |
| issued : date | when the report was issued | DiagnosticReport.issued |
| name : token | the name/code of the report | DiagnosticReport.results.name |
| performer : reference | who was the source of the report (organization) | DiagnosticReport.performer |
| requester : reference | who made a request that lead to the report | DiagnosticReport.requestDetail.requester |
| result : reference | link to an atomic result (observation resource) | DiagnosticReport.results.result |
| service : token | which diagnostic discipline/department created the report | DiagnosticReport.serviceCategory |
| specimen : reference | the specimen details | DiagnosticReport.results.specimen |
| status : token | The status of the report | DiagnosticReport.status |
| subject : reference | the subject of the report | DiagnosticReport.subject |
| test : token | a test requested that the report is in response to | DiagnosticReport.requestDetail.requestTest |

## 3.14: Resource Definition: DocumentReference

A reference to a document.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /documentreference/

A document reference is a reference to a document defined in some other format, or stored in some other system. Typically, Document Reference Resources are used in document indexing systems, such as IHE XDS (see the [XDS specific profile (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#xds-profile)), and also to refer to:

* [CDA documents (http://www.hl7.org/implement/standards/product\_brief.cfm?product\_id=7)](http://www.hl7.org/implement/standards/product_brief.cfm?product_id=7) in FHIR systems
* [FHIR documents (§2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document) stored elsewhere
* [PDF documents (http://en.wikipedia.org/wiki/Portable\_Document\_Format)](http://en.wikipedia.org/wiki/Portable_Document_Format) , and even digital records of faxes where sufficient information is available
* Other kinds of documents, such as records of prescriptions.

FHIR defines both a [document format (§2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document) and this document reference. FHIR documents are for documents that are authored and assembled in FHIR. This resource is for general references to other documents.

Note that there is no formal or limited definition of what a document is.

The document that is a target of the reference can be a reference to a FHIR document served by another server, or the target can be stored in the special [FHIR Binary Resource (§2.1.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.binary), or the target can be stored on some other server system. The document reference is also able to address documents that are retrieved by a service call such as an XDS.b RetrieveDocumentSet, or a DICOM exchange, or a v2 message query, though the way each of these works must be specified in an implementation guide.

### 3.14.1: Resource Content

See also the [Examples (§4.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreferenceEx) and the [Definitions (§5.20)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreferenceDefn).

<[**DocumentReference**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference) xmlns="http://hl7.org/fhir">

<[**masterIdentifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.masterIdentifier)><!-- **1..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Master Version Specific Identifier --></masterIdentifier>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Other identifiers for the document --></identifier>

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) The subject of the document --></subject>

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [What kind of document this is (LOINC if possible)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-codes) --></type>

<[**subtype**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.subtype)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [More detail about the document type](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-typecodes) --></subtype>

<[**author**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.author)><!-- **1..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who/what authored the document --></author>

<[**custodian**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.custodian)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Org which maintains the document --></custodian>

<[**authenticator**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.authenticator)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Who authenticated the document --></authenticator>

<[**created**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.created) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Document creation time -->

<[**indexed**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.indexed) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **1..1** When this document reference created -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [current | superseded | error](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "document-reference-status) -->

<[**docStatus**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.docStatus)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Status of the underlying document (http://hl7.org/fhir/vs/document-status.htm)](http://hl7.org/fhir/vs/document-status.htm)  --></docStatus>

<**[supersedes](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "documentreference-definitions.DocumentReference.supercedes" \o "If this document replaces another (this element must be understood))**><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([DocumentReference](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference.DocumentReference)) If this document replaces another --></supersedes>

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Human Readable description (title) -->

<[**confidentiality**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.confidentiality)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Sensitivity of source document](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-confidentiality) --></confidentiality>

<[**primaryLanguage**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.primaryLanguage) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Primary language of the document (http://tools.ietf.org/html/bcp47.htm)](http://tools.ietf.org/html/bcp47.htm)  -->

<[**mimeType**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.mimeType) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Mime type of the document (http://www.rfc-editor.org/bcp/bcp13.txt.htm)](http://www.rfc-editor.org/bcp/bcp13.txt.htm)  -->

<[**format**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.format)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Format of the document](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-formatcodes) --></format>

<[**size**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.size) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Size of the document in bytes -->

<[**hash**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.hash) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** HexBinary representation of SHA1 -->

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.location) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Where to access the document -->

<[**service**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.service)> <!-- **0..1** If access is not fully described by location -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.service.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Type of service (i.e. XDS.b)](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "valueset-documentreference-service-types) --></type>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.service.address) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Where service is located (usually a URL) -->

<[**parameter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.service.parameter)> <!-- **0..\*** Service call parameters -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.service.parameter.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Name of parameter -->

<[**value**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.service.parameter.value) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Parameter value -->

</parameter>

</service>

<[**context**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.context)> <!-- **0..1** Clinical context of document -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.context.code)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Type of context (i.e. type of event)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-event-code) --></code>

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.context.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Time described by the document --></period>

<[**facilityType**](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference-definitions.DocumentReference.context.facilityType)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Kind of facility where patient was seen](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-facilitycodes) --></facilityType>

</context>

</DocumentReference>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/documentreference.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/documentreference.profile.xml)

#### 3.14.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| DocumentReference.type | Type of a clinical document | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/doc-codes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-codes) |
| DocumentReference.subtype | Subtype of a clinical document | Example | [http://hl7.org/fhir/vs/xds-typecodes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-typecodes) |
| DocumentReference.status | The status of the document reference | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/document-reference-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-reference-status) |
| DocumentReference.docStatus | Status of the underlying document | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/document-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-status) |
| DocumentReference.confidentiality | Codes specifying the level of confidentiality of the XDS Document | Example | [http://hl7.org/fhir/vs/doc-confidentiality (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-confidentiality) |
| DocumentReference.primaryLanguage | A human language | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |
| DocumentReference.mimeType | The mime type of an attachment | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [BCP 13 (RFCs 2045, 2046, 2047, 4288, 4289 and 2049) (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) |
| DocumentReference.format | The format that the source document has | Example | [http://hl7.org/fhir/vs/xds-formatcodes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-formatcodes) |
| DocumentReference.service.type | Document Reference Service Type | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/documentreference-service-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-documentreference-service-types) |
| DocumentReference.context.code | This list of codes represents the main clinical acts being documented | Example | [http://hl7.org/fhir/vs/doc-event-code (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-event-code) |
| DocumentReference.context.facilityType | XDS Facility Type | Example | [http://hl7.org/fhir/vs/xds-facilitycodes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-facilitycodes) |

#### 3.14.1.2: Constraints

* A location or a service (or both) must be provided (xpath: exists(f:location) or exists(f:service))

### 3.14.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| authenticator : reference | Who authenticated the document | DocumentReference.authenticator |
| author : reference | Who/what authored the document | DocumentReference.author |
| confidentiality : token | Sensitivity of source document | DocumentReference.confidentiality |
| created : date | Document creation time | DocumentReference.created |
| custodian : reference | Org which maintains the document | DocumentReference.custodian |
| description : text | Human Readable description (title) | DocumentReference.description |
| event : token | Type of context (i.e. type of event) | DocumentReference.context.code |
| facility : token | Kind of facility where patient was seen | DocumentReference.context.facilityType |
| format : token | Format of the document | DocumentReference.format |
| identifier : token | Other identifiers for the document | DocumentReference.identifier |
| indexed : date | When this document reference created | DocumentReference.indexed |
| language : token | Primary language of the document | DocumentReference.primaryLanguage |
| location : string | Where to access the document | DocumentReference.location |
| period : date | Time described by the document | DocumentReference.context.period |
| size : integer | Size of the document in bytes | DocumentReference.size |
| status : token | current | superseded | error | DocumentReference.status |
| subject : reference | The subject of the document | DocumentReference.subject |
| subtype : token | More detail about the document type | DocumentReference.subtype |
| supersedes : reference | If this document replaces another | DocumentReference.supercedes |
| type : token | What kind of document this is (LOINC if possible) | DocumentReference.type |

## 3.15: Resource Definition: Encounter

An interaction between a patient and healthcare provider(s) for the purpose of providing healthcare service(s) or assessing the health status of a patient..

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /encounter/

A patient encounter is further characterized by the setting in which it takes place, amongst them are ambulatory, emergency, home health, inpatient and virtual encounters. An Encounter encompasses the lifecycle from pre-admission, the actual encounter (for ambulatory encounters), and admission, stay and discharge (for inpatient encounters). During the encounter the patient may move from practitioner to practitioner and location to location.

Because of the broad scope of Encounter, not all elements will be relevant in all settings. For this reason, admission/discharge related information is kept in a separate Hospitalization component within Encounter. The *class* element is used to distinguish between these settings, which will guide further validation and application of business rules.

There is also substantial variance from organization to organization (and between jurisdictions and countries) on which business events translate to the start of a new Encounter, or what level of aggregation is used for Encounter. I.e. Each single visit of a practitioner during a hospitalization may lead to a new instance of Encounter, but depending on use and systems involved, it may well be that this is aggregated to a single instance for the whole hospitalization. Even more aggregation may occur where jurisdictions introduce groups of Encounters for financial or other reasons. Encounters can be aggregated or grouped under other Encounters using the *partOf* element.

Encounter instances may exist before the actual encounter takes place to convey pre-admission information, including using Encounters elements to reflect the planned start date, planned accommodation or planned encounter locations. In this case the *status* element is set to 'planned'.

Specifically outside the scope of Encounter are:

* Group encounters -
* Appointment information - use the Appointment resource. Note that in many systems outpatient encounters (which are in scope for Encounter) and Appointment are used concurrently. In FHIR, Appointment is used for establishing a date for the encounter, while Encounter is applicable to information about the actual Encounter, i.e. the patient showing up.

### 3.15.1: Resource Content

See also the [Examples (§4.19)](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounterEx) and the [Definitions (§5.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounterDefn).

<[**Encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identifier(s) by which this encounter is known § --></identifier>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [E.g. active, aborted, finished §](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-state) -->

<[**class**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.class) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Inpatient | Outpatient etc. §](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "encounter-class) -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.type)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Specific type of encounter §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-type) --></type>

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) The patient present at the encounter § --></subject>

<[**participant**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.participant)> <!-- **0..\*** List of participants involved in the encounter § -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.participant.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..\*** [Kind of involvement of the participant §](http://hl7.org/implement/standards/fhir/fhir-book.htm#participant-type) -->

<[**practitioner**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.participant.practitioner)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) The practitioner that is involved § --></practitioner>

</participant>

<[**fulfills**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.fulfills)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Appointment](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) The appointment that scheduled this encounter § --></fulfills>

<[**start**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.start) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** The date and time the encounter starts -->

<[**length**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.length)><!-- **0..1** [Duration](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Duration) Quantity of time the encounter lasted --></length>

<[**reason[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.reason_x_)><!-- **0..1** [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)|[CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Reason the encounter takes place § --></reason[x]>

<[**indication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.indication)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Reason the encounter takes place --></indication>

<[**priority**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.priority)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Indicates the urgency of the encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-priority) --></priority>

<[**hospitalization**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization)> <!-- **0..1** Details about an admission to a clinic -->

<[**preAdmissionIdentifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.preAdmissionIdentifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Pre-admission identifier --></preAdmissionIdentifier>

<[**preAdmissionTest**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.preAdmissionTest)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Tests to be done before admission --></preAdmissionTest>

<[**origin**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.origin)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) The location the patient came from before admission --></origin>

<[**admitSource**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.admitSource)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Where the patient was admitted from (physician referral, transfer)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-admit-source) --></admitSource>

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Period of hospitalization --></period>

<**[accommodation](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "encounter-definitions.Encounter.hospitalization.accomodation" \o "Where the patient stays during this encounter)**> <!-- **0..\*** Where the patient stays during this encounter -->

<[**bed**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.accomodation.bed)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Bed --></bed>

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.accomodation.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Period during which the patient was assigned the bed --></period>

</accommodation>

<[**diet**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.diet)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Dietary restrictions for the patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-diet) --></diet>

<[**specialCourtesy**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.specialCourtesy)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Special courtesies (VIP, hospital board member)](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "valueset-encounter-special-courtesy) --></specialCourtesy>

<[**specialArrangement**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.specialArrangement)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Special arrangements (wheelchair, translator, stretcher)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-special-arrangements) --></specialArrangement>

<[**destination**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.destination)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Location the patient is discharged to --></destination>

<[**dischargeDisposition**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.hospitalization.dischargeDisposition)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Disposition a patient was released into](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-discharge-disposition) --></dischargeDisposition>

<**[readmission](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "encounter-definitions.Encounter.hospitalization.reAdmission" \o "Is readmission?)** value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Is readmission? -->

</hospitalization>

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.location)> <!-- **0..\*** List of locations the patient has been at -->

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.location.location)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) The location the encounter takes place --></location>

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.location.period)><!-- **1..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Time period during which the patient was present at the location --></period>

</location>

<[**serviceProvider**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.serviceProvider)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) The department or team that is providing care --></serviceProvider>

<[**partOf**](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-definitions.Encounter.partOf)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)) Another Encounter this encounter is part of --></partOf>

</Encounter>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/encounter.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/encounter.profile.xml)

#### 3.15.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Encounter.status | Current state of the encounter | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/encounter-state](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-state) |
| Encounter.class | Classification of the encounter | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/encounter-class](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-class) |
| Encounter.type | The type of encounter | Example | [http://hl7.org/fhir/vs/encounter-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-type) |
| Encounter.participant.type | Kind of participation | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/participant-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#participant-type) |
| Encounter.reason[x] | Reason | Unknown | No details provided yet |
| Encounter.priority | Indicates the urgency of the encounter | Example | [http://hl7.org/fhir/vs/encounter-priority (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-priority) |
| Encounter.hospitalization.preAdmissionTest | Tests done before admission | Unknown | No details provided yet |
| Encounter.hospitalization.admitSource | Where the patient was admitted from | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/encounter-admit-source (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-admit-source) |
| Encounter.hospitalization.diet | Medical, cultural or ethical food preferences to help with catering requirements | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/encounter-diet (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-diet) |
| Encounter.hospitalization.specialCourtesy | Special courtesies | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/encounter-special-courtesy (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-special-courtesy) |
| Encounter.hospitalization.specialArrangement | Special arrangements | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/encounter-special-arrangements (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-special-arrangements) |
| Encounter.hospitalization.dischargeDisposition | Discharge Disposition | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/encounter-discharge-disposition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-discharge-disposition) |

Notes:

* The *class* element describes the setting (in/outpatient etc.) in which the Encounter took place. Since this is important for interpreting the context of the encounter, choosing the appropriate business rules to enforce and management of the process, this element is required.
* The *Location* indicates where the patient has been during the encounter (he might visit multiple locations, e.g. to an MRI room for examinations, while *Accommodation* keeps information about the bed a patient stays at during a hospitalization.

### 3.15.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| fulfills : reference | The appointment that scheduled this encounter | Encounter.fulfills |
| identifier : token | Identifier(s) by which this encounter is known | Encounter.identifier |
| indication : reference | Reason the encounter takes place | Encounter.indication |
| length : integer | Length of encounter in days | Encounter.length |
| start : date | The date and time the encounter starts | Encounter.start |
| status : token | E.g. active, aborted, finished | Encounter.status |
| subject : reference | The patient present at the encounter | Encounter.subject |

## 3.16: Resource Definition: FamilyHistory

Significant health events and conditions for people related to the subject relevant in the context of care for the subject.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /familyhistory/

This resource records significant health events and conditions for people related to the subject. This information can be known to different levels of accuracy. Sometimes the exact condition ('asthma') is known, and sometimes it is less precise ('some sort of cancer'). Equally, sometimes the person can be identified ('my aunt Agatha') and sometimes all that is known is that the person was an uncle.

The entire family history for an individual is stored in a single resource.

### 3.16.1: Resource Content

See also the [Examples (§4.20)](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistoryEx) and the [Definitions (§5.22)](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistoryDefn).

<[**FamilyHistory**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory) xmlns="http://hl7.org/fhir">

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Subject of this history § --></subject>

<[**note**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.note) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Additional details -->

<[**relation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation)> <!-- **0..\*** The relation -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** The family member who had the condition § -->

<[**relationship**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.relationship)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Relationship to the subject §](http://hl7.org/implement/standards/fhir/fhir-book.htm#familial-relationship) --></relationship>

<[**deceased[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.deceased_x_)><!-- **0..1** [boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)|[Age](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Age)|[Range](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Range)|[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) Is the person deceased --></deceased[x]>

<[**note**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.note) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** General note about the related person -->

<[**condition**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.condition)> <!-- **0..\*** The Condition that the related person had -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.condition.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) The condition --></type>

<[**outcome**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.condition.outcome)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) deceased | permanent disability | etc. --></outcome>

<[**onset[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.condition.onset_x_)><!-- **0..1** [Age](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Age)|[Range](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Range)|[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) How old the person was when the condition manifested --></onset[x]>

<[**note**](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory-definitions.FamilyHistory.relation.condition.note) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** General notes -->

</condition>

</relation>

</FamilyHistory>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/familyhistory.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/familyhistory.profile.xml)

#### 3.16.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| FamilyHistory.relation.relationship | The nature of the relationship between the patient and the person with the condition. Based on the HL7v3 RoleCode: OID: 2.16.840.1.113883.5.111 with some inappropriate items removed | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/familial-relationship](http://hl7.org/implement/standards/fhir/fhir-book.htm#familial-relationship) |
| FamilyHistory.relation.condition.outcome | The result of the condition for the patient. E.g. death, permanent disability, temporary disability, etc. | Unknown | No details provided yet |

### 3.16.2: Genetic Family History

This resource represents a "bare bones" Family History as typically supported simple clinical systems. A more elaborate version incorporating more detailed information as appropriate for genetic counselling will be developed as a profile on this resource.

### 3.16.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| subject : reference | The identity of a subject to list family history items for | FamilyHistory.subject |

## 3.17: Resource Definition: Group

Represents a defined collection of entities that may be discussed or acted upon collectively but which are not expected to act collectively and are not formally or legally recognized. I.e. A collection of entities that isn't an Organization.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /group/

There are 2 resources that provide for constructing collections of other resources:

* The [List resource (§3.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#list) - enumerates a collection of resources that are in some list, and provides features for managing the list. The list resource references other resources
* This Group resource - defines a group of specific people, animals, devices, etc. by enumerating them, or by describing qualities that group members have. The group resource refers to other resources, possibly implicitly

The group resource is used in one of two ways:

1. To define a group of specific people, animals, devices, etc. that is being tracked, examined or otherwise referenced as part of healthcare-related activities; and
2. To define a set of \*possible\* people, animals, devices, etc. that are of interest for some intended future healthcare-related activities

Examples of the former could include group therapy or treatment sessions, exposed entities tracked as part of public health, etc. The latter might be used to define expected subjects for a clinical study.

Both use cases are handled by a single resource because the data elements captured tend to be similar.

### 3.17.1: Resource Content

See also the [Examples (§4.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#groupEx) and the [Definitions (§5.23)](http://hl7.org/implement/standards/fhir/fhir-book.htm#groupDefn).

<[**Group**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Unique id § --></identifier>

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Group Classification §](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-type) -->

<[**actual**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.actual) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** Descriptive or actual § -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Kind of Group members § --></code>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Label for Group § -->

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.quantity) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of members § -->

<[**characteristic**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.characteristic)> <!-- **0..\*** Trait of group members -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.characteristic.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Kind of characteristic --></type>

<[**value[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.characteristic.value_x_)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept)|[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)|[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)|[Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity)|[Range](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Range) Value held by characteristic --></value[x]>

<[**exclude**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.characteristic.exclude) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** Group includes or excludes -->

</characteristic>

<[**member**](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-definitions.Group.member)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)|[Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)) Who is in group --></member>

</Group>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/group.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/group.profile.xml)

#### 3.17.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Group.type | Types of resources that are part of group | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/group-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-type) |
| Group.code | Kind of particular resource | Unknown | No details provided yet |
| Group.characteristic.type | List of characteristics used to describe group members. E.g. gender, age, owner, location, etc. | Unknown | No details provided yet |
| Group.characteristic.value[x] | Value of descriptive member characteristic | Unknown | No details provided yet |

#### 3.17.1.2: Constraints

* Can only have members if group is "actual" (xpath: f:actual/@value='true' or not(exists(f:member)))
* Can't have more members associated with the group than the value specified for "quantity" (xpath: not(f:quantity) or not(f:member) or not(f:quantity>count(f:member)))
* On Group.member: Member resource types must agree with group type (xpath on f:Group/f:member: lower-case(f:type/@value)=parent::f:Group/f:type/@value or (f:type/@value='Patient' and parent::f:Group/f:type/@value=('animal','person')))

### 3.17.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| actual : token | Descriptive or actual | Group.actual |
| code : token | The kind of resources contained | Group.code |
| exclude : token | Group includes or excludes | Group.characteristic.exclude |
| group-type : token | The type of resources the group contains | Group.type |
| identifier : token | Unique id | Group.identifier |
| member : reference | Who is in group | Group.member |
| type : token | Kind of characteristic | Group.characteristic.type |
| type-value : composite | A composite of both type and value |  |
| value : token | Value held by characteristic | Group.characteristic.value[x] |

## 3.18: Resource Definition: ImagingStudy

Manifest of a set of images produced in study. The set of images may include every image in the study, or it may be an incomplete sample, such as a list of key images.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /imagingstudy/

This resource summarises a series of images or other instances generated as part of an imaging study, and provides references to where the images are available using [WADO-RS](ftp://medical.nema.org/medical/dicom/supps/LB/sup161_lb.pdf). This resource is used to make information concerning images etc. that are available in other clinical contexts such as [diagnostic reports (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport), [Care Plans (§3.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan), etc. Also, see the use case description below.

This resources has been specifically designed with use in DICOM contexts in mind. The content is closely based on the definitions of the equivalent DICOM constructs, and informed by usage patterns already established through DICOM implementation practices, including XDS-I. It is not, however, necessary to use DICOM infrastructure in order to use this resource.

### 3.18.1: Resource Content

See also the [Examples (§4.22)](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudyEx) and the [Definitions (§5.24)](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudyDefn).

<[**ImagingStudy**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy) xmlns="http://hl7.org/fhir">

<[**dateTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.dateTime) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Shortname -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Who the images are of --></subject>

<[**uid**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.uid) value="[[oid](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.oid)]"/><!-- **1..1** Formal identifier for the study (0020,000D) -->

<[**accessionNo**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.accessionNo)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Accession Number (0008,0050) --></accessionNo>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Other identifiers for the study (0020,0010) --></identifier>

<[**modalities**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.modalities) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..\*** [All series.modality if actual acquisition modalities](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "imaging-modality) -->

<[**referrer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.referrer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Referring physician (0008,0090) --></referrer>

<[**availability**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.availability) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Instance Availability (0008,0056)](http://hl7.org/implement/standards/fhir/fhir-book.htm#instance-availability) -->

<[**url**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.url) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Retrieve URI (0040,E010) -->

<[**numberOfSeries**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.numberOfSeries) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **1..1** Number of Study Related Series (0020,1206) -->

<[**numberOfInstances**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.numberOfInstances) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **1..1** Number of Study Related Instances (0020,1208) -->

<[**clinicalInformation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.clinicalInformation) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Diagnoses etc. with request (0008,1080) -->

<[**procedure**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.procedure)><!-- **0..\*** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) Type of procedure performed (0008,1032) --></procedure>

<[**interpreter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.interpreter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who interpreted images (0008,1060) --></interpreter>

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Institution-generated description (0008,1030) -->

<[**series**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series)> <!-- **0..\*** Each study has one or more series of instances -->

<[**number**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.number) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of this series in overall sequence (0020,0011) -->

<[**modality**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.modality) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [The modality of this sequence (0008,0060)](http://hl7.org/implement/standards/fhir/fhir-book.htm#modality) -->

<[**uid**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.uid) value="[[oid](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.oid)]"/><!-- **1..1** Formal identifier for this series (0020,000E) -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** A description of the series (0008,103E) -->

<[**numberOfInstances**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.numberOfInstances) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **1..1** Number of Series Related Instances (0020,1209) -->

<[**availability**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.availability) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Instance Availability (0008,0056)](http://hl7.org/implement/standards/fhir/fhir-book.htm#instance-availability) -->

<[**url**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.url) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Retrieve URI (0040,E010) -->

<[**bodySite**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.bodySite)><!-- **0..1** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) [Body part examined (Map from 0018,0015)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) --></bodySite>

<[**dateTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.dateTime) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When the series started -->

<[**instance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.instance)> <!-- **1..\*** A single instance taken from a patient (image or other) -->

<[**number**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.instance.number) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** The number of this instance in the series (0020,0013) -->

<[**uid**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.instance.uid) value="[[oid](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.oid)]"/><!-- **1..1** Formal identifier for this instance (0008,0018) -->

<**[sopclass](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "imagingstudy-definitions.ImagingStudy.series.instance.sopclass" \o "DICOM Image type)** value="[[oid](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "datatypes.oid)]"/><!-- **1..1** DICOM class type (0008,0016) -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.instance.type) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Type of instance (0004,1430) -->

<[**title**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.instance.title) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Description to be provided -->

<[**url**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.instance.url) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** WADO / WADO-RS service where instance is available -->

<[**attachment**](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy-definitions.ImagingStudy.series.instance.attachment)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) A FHIR resource with content for this instance --></attachment>

</instance>

</series>

</ImagingStudy>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/imagingstudy.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/imagingstudy.profile.xml)

#### 3.18.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| ImagingStudy.modalities | Type of acquired image data in the instance | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/imaging-modality](http://hl7.org/implement/standards/fhir/fhir-book.htm#imaging-modality) |
| ImagingStudy.availability ImagingStudy.series.availability | Availability of the resource | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/instance-availability](http://hl7.org/implement/standards/fhir/fhir-book.htm#instance-availability) |
| ImagingStudy.series.modality | Type of data in the instance | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/modality](http://hl7.org/implement/standards/fhir/fhir-book.htm#modality) |
| ImagingStudy.series.bodySite | Codes describing anatomical locations. May include laterality | Example | [http://hl7.org/fhir/vs/body-site (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) |

Note that this resource uses OIDs rather than codes in order to follow DICOM practice.

#### 3.18.1.2: Use Case

The following storyboard illustrates the primary use case for this resource:

An oncologist, Karen, is seeing patients in her clinic, and would like background on the patients she is seeing today. Her first patient of the day, Alex. has arrived. She launches her Electronic Medical Record (EMR) software, and makes a Patient query on Alex using his last name. The EMR software makes a FHIR query on the Patient resource, to provide background demographic information for cover page rendering. The EMR software makes a subsequent FHIR query on the Condition resource, and reports that Alex is suspected to have prostate cancer. With this information, Karen decides to check for two further tests - the results of a Prostate-Specific Antigen (PSA) laboratory test, and of a CT exam performed at the local diagnostic facility. First, a FHIR query is made against the Observation resource to query for the most recent value of PSA (the EMR also queries previous values of PSA for trending). For the CT exam, the EMR software queries on the ImagingStudy resource to retrieve a list of available images with other relevant constraints (such as modality, body region etc.). This returns back the studies available, with relevant meta-data about each study, its series and images. This information will help Karen to select which study would like to review. Using the WADO-RS references provided, the artifacts Karen would like to review can be downloaded and viewed using capable DICOM viewing software.

### 3.18.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| accession : token | the accession id for the image | ImagingStudy.accessionNo |
| bodysite : token | Body part examined (Map from 0018,0015) | ImagingStudy.series.bodySite |
| date : date | the date the study was done was taken | ImagingStudy.dateTime |
| dicomClass : token | DICOM class type (0008,0016) | ImagingStudy.series.instance.sopclass |
| modality : token | the modality of the image | ImagingStudy.series.modality |
| series : token | the series id for the image | ImagingStudy.series.uid |
| size : integer | the size of the image in MB - may include > or < in the value |  |
| study : token | the study id for the image | ImagingStudy.uid |
| subject : reference | Who the study is about | ImagingStudy.subject |
| uid : token | Formal identifier for this instance (0008,0018) | ImagingStudy.series.instance.uid |

## 3.19: Resource Definition: Immunization

Immunization event information.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /immunization/

The immunization resource is intended to cover the administration of vaccines to patients across all healthcare disciplines in all care settings and all regions. This includes immunization of both humans and animals but does not include the administration of non-vaccine agents, even those that may have or claim immunological effects.

Additionally, the immunization resource is expected to cover key concepts related to the creation, revision and querying of a patient's immunization history. This resource - through consultation with the PHER work group - is believed to meet key use cases and information requirements as defined in the existing HL7 v2.x immunization implementation guide, HL7 v3 POIZ domain and Immunization Domain Analysis Model.

**Relation to other resources** This resource references the following resources:

* AdverseReaction
* Patient
* Practitioner
* Organization
* Location
* Observation

This resource is referenced by the ImmunizationProfile resource.

### 3.19.1: Resource Content

See also the [Examples (§4.23)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationEx) and the [Definitions (§5.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationDefn).

<[**Immunization**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization) xmlns="http://hl7.org/fhir">

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** Vaccination Administration Date -->

<[**vaccineType**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccineType)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Vaccine Product Administered --></vaccineType>

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Who this immunization was administered to --></subject>

<[**refusedIndicator**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.refusedIndicator) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** Refusal Indicator -->

<[**reported**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.reported) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** If self-reported -->

<[**performer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.performer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Vaccine Administering Provider Name --></performer>

<[**requester**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.requester)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Vaccine Ordering Provider Name --></requester>

<[**manufacturer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.manufacturer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Vaccine Manufacturer --></manufacturer>

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.location)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Vaccine Administration Facility --></location>

<[**lotNumber**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.lotNumber) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Vaccine Lot Number -->

<[**expirationDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.expirationDate) value="[[date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date)]"/><!-- **0..1** Vaccine Expiration Date -->

<[**site**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.site)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Vaccine Site of Administration --></site>

<[**route**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.route)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Vaccine Route of Administration --></route>

<[**doseQuantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.doseQuantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Vaccine dosage --></doseQuantity>

<[**explanation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.explanation)> <!-- **0..1** Administration / Refusal Reasons -->

<[**reason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.explanation.reason)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Administration Reasons --></reason>

<[**refusalReason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.explanation.refusalReason)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Explanation of refusal / exemption --></refusalReason>

</explanation>

<[**reaction**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.reaction)> <!-- **0..\*** Details of a reaction that follows immunization -->

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.reaction.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Reaction Date -->

<[**detail**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.reaction.detail)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([AdverseReaction](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction.AdverseReaction)|[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation.Observation)) Details of the reaction --></detail>

<[**reported**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.reaction.reported) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Self-reported indicator -->

</reaction>

<[**vaccinationProtocol**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol)> <!-- **0..1** Vaccine Administration Protocol -->

<[**doseSequence**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol.doseSequence) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **1..1** Dose Number -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Vaccine Administration Protocol Description -->

<[**authority**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol.authority)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Vaccine Administration Protocol Authority --></authority>

<[**series**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol.series) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Vaccine Series -->

<[**seriesDoses**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol.seriesDoses) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Dose Number Recommendation -->

<[**doseTarget**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol.doseTarget)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Targeted Disease --></doseTarget>

<[**doseStatus**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol.doseStatus)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Dose Status --></doseStatus>

<[**doseStatusReason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-definitions.Immunization.vaccinationProtocol.doseStatusReason)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Dose Status Reason --></doseStatusReason>

</vaccinationProtocol>

</Immunization>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/immunization.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/immunization.profile.xml)

#### 3.19.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Immunization.vaccineType | The type of vaccine administered | Unknown | No details provided yet |
| Immunization.site | The site at which the vaccine was administered | Unknown | No details provided yet |
| Immunization.route | The route by which the vaccine was administered | Unknown | No details provided yet |
| Immunization.explanation.reason | The reason why a vaccine was administered | Unknown | No details provided yet |
| Immunization.explanation.refusalReason | The reason why a vaccine administration was refused | Unknown | No details provided yet |
| Immunization.vaccinationProtocol.doseTarget | The disease target of the vaccination protocol | Unknown | No details provided yet |
| Immunization.vaccinationProtocol.doseStatus | The status of the vaccination protocol (i.e. should this count) | Unknown | No details provided yet |
| Immunization.vaccinationProtocol.doseStatusReason | The reason for the determining if a vaccination should count or why vaccination should not count. | Unknown | No details provided yet |

### 3.19.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| date : date | Vaccination Administration / Refusal Date | Immunization.date |
| location : reference | The service delivery location or facility in which the vaccine was / was to be administered | Immunization.location |
| lotNumber : string | Vaccine Lot Number | Immunization.lotNumber |
| manufacturer : reference | Vaccine Manufacturer | Immunization.manufacturer |
| performer : reference | The practitioner who administered the vaccination | Immunization.performer |
| refusalReason : token | Explanation of refusal / exemption | Immunization.explanation.refusalReason |
| requester : reference | The practitioner who ordered the vaccination | Immunization.requester |
| subject : reference | The subject of the vaccination event / refusal | Immunization.subject |
| vaccineType : token | Vaccine Product Type Administered | Immunization.vaccineType |

## 3.20: Resource Definition: ImmunizationProfile

A patient's point-of-time immunization status and recommendation with optional supporting justification.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /immunizationprofile/

The ImmunizationProfile resource is intended to cover communication of a specified patient's immunization recommendation and status across all healthcare disciplines in all care settings and all regions.

Additionally, the ImmunizationProfile resource is expected to cover key concepts related to the querying of a patient's immunization recommendation and status. This resource - through consultation with the PHER work group - is believed to meet key use cases and information requirements as defined in the existing HL7 v3 POIZ domain and Immunization Domain Analysis Model.

**Relation to other resources** This resource references the following resources:

* AdverseReaction
* Patient
* Organization
* Immunization
* Observation

There are not any resources that reference this resource directly.

One of the considerations for this resource is if it is better for this resource to be a profile of the CarePlan resource or if it is more appropriate for this to be a separate resource due to the number of immunization profile-specific data elements. Please consider this when submitting your ballot comments.

### 3.20.1: Resource Content

See also the [Examples (§4.24)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofileEx) and the [Definitions (§5.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofileDefn).

<[**ImmunizationProfile**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile) xmlns="http://hl7.org/fhir">

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Who this profile is for --></subject>

<[**recommendation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation)> <!-- **1..\*** Vaccine administration recommendations -->

<[**recommendationDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.recommendationDate) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** Recommendation date -->

<[**vaccineType**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.vaccineType)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Vaccine that pertains to the recommendation --></vaccineType>

<[**doseNumber**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.doseNumber) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Recommended dose number -->

<[**forecastStatus**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.forecastStatus) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Vaccine administration status](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-forecast-status) -->

<[**dateCriterion**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.dateCriterion)> <!-- **0..\*** Pertinent dates -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.dateCriterion.code)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Date classification of recommendation --></code>

<[**value**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.dateCriterion.value) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** Date recommendation -->

</dateCriterion>

<[**protocol**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.protocol)> <!-- **0..1** Vaccine Administration Protocol -->

<[**doseSequence**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.protocol.doseSequence) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Dose Number -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.protocol.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Vaccine Administration Protocol Description -->

<[**authority**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.protocol.authority)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Vaccine Administration Protocol Authority --></authority>

<[**series**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.protocol.series) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Vaccine Series -->

</protocol>

<[**supportingImmunization**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.supportingImmunization)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Immunization](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization.Immunization)) Supporting Immunization --></supportingImmunization>

<[**supportingAdverseEventReport**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.supportingAdverseEventReport)> <!-- **0..\*** Supporting adverse event report -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.supportingAdverseEventReport.identifier) value="[[id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id)]"/><!-- **1..\*** Adverse event report identifier -->

<[**reportType**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.supportingAdverseEventReport.reportType)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Adverse event report classification --></reportType>

<[**reportDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.supportingAdverseEventReport.reportDate) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Adverse event report date -->

<[**text**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.supportingAdverseEventReport.text) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Adverse event report text -->

<[**reaction**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.supportingAdverseEventReport.reaction)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([AdverseReaction](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction.AdverseReaction)) Documented reaction --></reaction>

</supportingAdverseEventReport>

<[**supportingPatientObservation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile-definitions.ImmunizationProfile.recommendation.supportingPatientObservation)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation.Observation)) Supporting Patient Observation --></supportingPatientObservation>

</recommendation>

</ImmunizationProfile>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/immunizationprofile.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/immunizationprofile.profile.xml)

#### 3.20.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| ImmunizationProfile.recommendation.vaccineType | The type of vaccine administered | Unknown | No details provided yet |
| ImmunizationProfile.recommendation.forecastStatus | The patient's status with respect to a vaccination protocol | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/immunization-forecast-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-forecast-status) |
| ImmunizationProfile.recommendation.dateCriterion.code | Classifies date criterion with respect to conveying information about a patient's vaccination status (e.g. due date, latest to give date, etc.) | Unknown | No details provided yet |
| ImmunizationProfile.recommendation.supportingAdverseEventReport.reportType | Classifies an adverse event report | Unknown | No details provided yet |

### 3.20.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| subject : reference | Who this profile is for | ImmunizationProfile.subject |
| vaccineType : token | Vaccine that pertains to the recommendation | ImmunizationProfile.recommendation.vaccineType |

## 3.21: Resource Definition: List

A set of information summarized from a list of other resources.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /list/

There are 2 resources that provide for constructing collections of other resources:

* This List resource - enumerates a collection of resources that are in some list, and provides features for managing the list. The list resource references other resources
* The [Group resource (§3.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#group) - defines a group of specific people, animals, devices, etc. by enumerating them, or by describing qualities that group members have. The group resource refers to other resources, possibly implicitly

List resources are used in many places, including for allergies, medications, alerts, medical history, etc.

### 3.21.1: Resource Content

See also the [Examples (§4.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#listEx) and the [Definitions (§5.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#listDefn).

<[**List**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List) xmlns="http://hl7.org/fhir">

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) What the purpose of this list is --></code>

<[**source**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.source)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Source of the list --></source>

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When the list was prepared -->

<[**ordered**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.ordered) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Whether items in the list have a meaningful order -->

<[**mode**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.mode) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [working | snapshot | changes](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-mode) -->

<[**entry**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.entry)> <!-- **0..\*** Entries in the list -->

<[**flag**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.entry.flag)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Workflow information about this item --></flag>

<[**deleted**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.entry.deleted) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If this item is actually marked as deleted -->

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.entry.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When item added to list -->

<[**item**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.entry.item)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Actual entry --></item>

</entry>

<[**emptyReason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-definitions.List.emptyReason)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Why list is empty --></emptyReason>

</List>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/list.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/list.profile.xml)

#### 3.21.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| List.code | What the purpose of a list is | Unknown | No details provided yet |
| List.mode | The processing mode that applies to this list | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/list-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-mode) |
| List.entry.flag | Codes that provide further information about the reason and meaning of the item in the list | Unknown | No details provided yet |
| List.emptyReason | If a list is empty, why it is empty | Unknown | No details provided yet |

#### 3.21.1.2: Constraints

* The deleted flag can only be used if the (xpath: (f:mode/@value = 'changes') or not(exists(f:entry/f:item/f:deleted)))
* A list can only have an emptyReason if it is empty (xpath: not(exists(f:emptyReason) and exists(f:entry)))

### 3.21.2: List Mode & Item Deleted

There are several different kinds of use for a List resource:

|  |  |
| --- | --- |
| working | This list is the master list, maintained in an ongoing fashion with regular updates as the real world list it is tracking changes |
| snapshot | This list was prepared as a snapshot. It should not be assumed to be current |
| changes | The list is prepared as a statement of changes that have been made or recommended |

The final mode - a change list, may include deleted items. A typical case is a medication list in a discharge summary, where the list includes items that have been both added and deleted. In order to ensure that the list is safe to process, any item where the flag implies that the item has actually been deleted must have the deleted element set to true.

Note that there is no implication about the status of a resource that has been deleted. The only statement that is made is that the resource has been dropped from the list. However applications should ensure that the implication of adding or deleting items from the list is consistent with the logical status of the resource and its contents.

A proper use of List.mode = "changes" with a deleted resource is in a medications list for a discharge summary. See Example "med-list". An improper use would be if the list was a working list of patient medications in a clinical tracking system, and list item flags were used to implement version tracking history within the resource.

### 3.21.3: Narrative Content

The narrative portion of the List resource should contain a summary of key properties of the items in the list, along with a human readable summary of their flags (if present).

An HTML table is the recommended approach, though this is not required. There should be a representation in the narrative for each item in the list, and vice versa, along with clear use of visual hints (borders, lines, bullet marks, etc.) to ensure that human readers do not get confused about which flags belongs with which item on space-poor displays.

This means that the narrative content of the list will be limited to the version of the contained resources at the time the list was last updated. (It may be even earlier if the narrative isn't updated to reflect the most recent version of all referenced resources at each update. Best practice for 'working' lists is to update the narrative to reflect the most recent content of all list elements each time the list is revised). Lists should therefore not be relied on as a real-time view of the referenced content. There are a few possible approaches to work around this issue:

* Provide minimal information about the listed resources, possibly limited to only a link. (Not recommended as this severely limits the usefulness of the narrative and is particularly problematic for things like documents where the only attested content might be the List narrative)
* Include only "generated" narrative, so the retriever can easily generate their own "current" view of the list by retrieving the referenced resources, ignoring the fixed narrative.
* The server hosting the list can subscribe to all referenced resources and auto-update the narrative each time one of the referenced resources changes (or at least on a semi-frequent basis)

### 3.21.4: Empty Reason

If the list is empty, there could be several different reasons why this is so. For example:

* There are no appropriate entries for the list (i.e. the patient has no known medications/allergies/history)
* The sender (human or system) deemed that these were not related to this context of patient care (usually for privacy related reasons)
* The source system doesn't support these type of entries
* The information to populate the list wasn't gathered - i.e. "Not asked"

Given these possibilities, and the common and significant first case, source systems SHOULD provide an empty reason if the list is empty. Because of the importance of this case, the [special value "nil known"](http://hl7.org/implement/standards/fhir/fhir-book.htm#special-values) should be used when there are no (significant) entries in this context of care. Note that this concept is sometimes described differently, such as "patient denies taking medications", or "patient was unable to identify any relevant medical history".

When receiving a list, systems should not assume that the list is complete (some entries may have been withheld for a variety of reasons), unless there are specific trading partner arrangements in place or, if the list is empty, that there are actually nil known, unless the "nil known" code is present.

If the list is empty, the narrative should contain text equivalent to the empty reason.

### 3.21.5: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| code : token | What the purpose of this list is | List.code |
| date : date | When the list was prepared | List.date |
| emptyReason : token | Why list is empty | List.emptyReason |
| item : reference | Actual entry | List.entry.item |
| source : reference | Source of the list | List.source |

## 3.22: Resource Definition: Location

Contact details and position information for a physical place that may be visited and where healthcare resources and participants may be found or contained, accommodated, or stored.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /location/

A Location includes both incidental locations (a place at which is used without prior designation or authorization) and dedicated, formally appointed locations. Examples of use for Location are:

* A hospital building, clinic or GP's office, a home
* A ward, corridor, bedroom, emergency room or operation room
* A freezer or cabinet
* An ambulance, personal car or roadside location

Non-examples are:

* An MRI-device (the room in which the device is placed is the Location)
* ...

### 3.22.1: Resource Content

See also the [Examples (§4.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#locationEx) and the [Definitions (§5.28)](http://hl7.org/implement/standards/fhir/fhir-book.htm#locationDefn).

<[**Location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location) xmlns="http://hl7.org/fhir">

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Name of the location -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Description of the Location -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.type)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Classification of the location](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-location-type) --></type>

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.telecom)><!-- **0..1** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) Contact details of the location --></telecom>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.address)><!-- **0..1** [Address](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address) Physical location --></address>

<[**position**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.position)> <!-- **0..1** The absolute geographic location (from KML) -->

<[**longitude**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.position.longitude) value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **1..1** Longitude (from KML) -->

<[**latitude**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.position.latitude) value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **1..1** Latitude (from KML) -->

<[**altitude**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.position.altitude) value="[[decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)]"/><!-- **0..1** Altitude (from KML) -->

</position>

<[**provider**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.provider)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) The organization that provides services at the location --></provider>

<[**active**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.active) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Whether the location is still used to provide services -->

<[**partOf**](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-definitions.Location.partOf)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Another Location which this Location is physically inside of --></partOf>

</Location>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/location.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/location.profile.xml)

#### 3.22.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Location.type | Indicates what kind of location this is. | Example | [http://hl7.org/fhir/vs/location-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-location-type) |

### 3.22.2: Notes:

* Locations may range from whole buildings to cabinets; it is possible to relate smaller Locations to their containing bigger Location using the Location.partOf element.
* Location.position is expressed using the same syntax, datum and reference system as Google/OGS's [KML (http://www.opengeospatial.org/standards/kml)](http://www.opengeospatial.org/standards/kml) .

### 3.22.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| active : token | Whether to search for active or inactive locations |  |
| address : string | A (part of the) address of the location |  |
| name : string | A (portion of the) name of the location |  |
| near : token | The coordinates expressed as [lat],[long] (refer KML) to find locations near to (servers may search using a square rather than a circle for efficiency) |  |
| near-distance : token | A distance quantity to limit the near search to locations within a specific distance |  |
| partof : token | The location of which this location is a part |  |
| type : token | A code for the type of location |  |

## 3.23: Resource Definition: Media

A Photo, Video, or audio recording acquired or used in healthcare. The actual content maybe inline or provided by direct reference.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /media/

The Media resource contains photos, videos, and audio recordings. It is used with media acquired or used as part of the healthcare process. Here are some typical usages:

* Photos of patients and staff for identification purposes
* Photos and videos of diagnostic or care provision procedures for recording purposes
* Storing scans and faxes of paper documents where not enough metadata exists to create a [DocumentReference (§3.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference)
* Images on diagnostic reports

Although the Media resource is allowed to contain images collected by a DICOM based system, DICOM images would preferentially be made available in a FHIR eco-system by provision of an [ImagingStudy (§3.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy) resource with references to a [WADO-RS server](ftp://medical.nema.org/medical/dicom/supps/LB/sup161_lb.pdf).

### 3.23.1: Resource Content

See also the [Examples (§4.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#mediaEx) and the [Definitions (§5.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#mediaDefn).

<[**Media**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media) xmlns="http://hl7.org/fhir">

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [photo | audio | video §](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-type) -->

<[**subtype**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.subtype)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [The type of acquisition equipment/process §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-subtype) --></subtype>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identifier(s) for the image § --></identifier>

<[**dateTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.dateTime) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When the media was taken/recorded § -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who/What this Media is a record of § --></subject>

<[**requester**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.requester)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who asked that this image be collected § --></requester>

<[**operator**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.operator)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) The person who generated the image § --></operator>

<[**view**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.view)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Imaging view e.g. Lateral or Antero-posterior §](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "valueset-media-view) --></view>

<[**deviceName**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.deviceName) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name of the device/manufacturer § -->

<[**height**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.height) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Height of the image in pixels(photo/video) § -->

<[**width**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.width) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Width of the image in pixels (photo/video) § -->

<[**frames**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.frames) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of frames if > 1 (photo) § -->

<[**length**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.length) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Length in seconds (audio / video) § -->

<[**content**](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-definitions.Media.content)><!-- **1..1** [Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) Actual Media - reference or data --></content>

</Media>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/media.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/media.profile.xml)

#### 3.23.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Media.type | Whether the Media is a photo, video, or audio | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/media-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-type) |
| Media.subtype | The type of acquisition equipment/process | Example | [http://hl7.org/fhir/vs/media-subtype (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-subtype) |
| Media.view | Imaging view (projection) used when collecting an image | Example | [http://hl7.org/fhir/vs/media-view (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-view) |

#### 3.23.1.2: Constraints

* Frames can only be used for a photo (xpath: (f:type/@value='photo') or not(f:frames))
* Width can only be used for a photo or video (xpath: not(f:type/@value='audio') or not(f:width))
* Height can only be used for a photo or video (xpath: not(f:type/@value='audio') or not(f:height))
* Length can only be used for an audio or a video (xpath: not(f:type/@value='photo') or not(f:length))

### 3.23.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| date : date | When the media was taken/recorded | Media.dateTime |
| identifier : token | Identifier(s) for the image | Media.identifier |
| operator : reference | The person who generated the image | Media.operator |
| subject : reference | Who/What this Media is a record of | Media.subject |
| subtype : token | The type of acquisition equipment/process | Media.subtype |
| type : token | photo | audio | video | Media.type |
| view : token | Imaging view e.g. Lateral or Antero-posterior | Media.view |

## 3.24: Resource Definition: Medication

This is primarily for identification and definition of Medication, but also covers ingredients and packaging.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /medication/

Representing Medication in the majority of healthcare settings is a matter of identifying an item from a list and then conveying a reference for the item selected either into a patient related resource or to other applications. Additional information about the medication is frequently provided for human verification but a full representation of the details of composition and efficacy of the medicine is conveyed by referring to drug dictionaries by means of the codes they define. There are some occasions where it is necessary to identify slightly more detail, such as when dispensing a package containing a particular medicine requires identification both of the medicine and the package at once. There are also some occasions (e.g. custom formulations) where the composition of a medicine must be represented. In these cases the ingredients of the medicine have to be specified together with the amount contained, though the medication resource does not provide full details.

The medication resource allows for medications to be characterised as either a product or a package; this classification is important because it affects the interpretation of a prescribed amount. For instance, is the prescribed amount 20 tablets, or 20 packages of 50 tablets each? However the *kind* element is not required because not all contexts of use are involved with prescription (medication statements, for instance). Typically, however, profiles describing the use of the medication resource in a prescribing environment will make the *kind* element required.

Depending on whether the medication is a product or a package, further details about the composition can be provided. A product has a form (tablet, suspension, etc.) and a list of ingredients with quantities. The ingredients may be other medications or substances. A package has a container (vacuum packed box, jar, etc.) and a list of the products or other packages that are in the package.

todo: Is it necessary to assign an identifying code to a medication record so that a system's list of medication resources can also be used as a coding system?

### 3.24.1: Resource Content

See also the [Examples (§4.28)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationEx) and the [Definitions (§5.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationDefn).

<[**Medication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication) xmlns="http://hl7.org/fhir">

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Common / Commercial name § -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) References to std. medication terminologies § --></code>

<[**isBrand**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.isBrand) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** True if a brand § -->

<[**manufacturer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.manufacturer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Manufacturer of the item § --></manufacturer>

<[**kind**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.kind) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [product | package §](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-kind) -->

<[**product**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.product)> <!-- **0..1** If is a product -->

<[**form**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.product.form)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Powder | tablets | carton etc. --></form>

<[**ingredient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.product.ingredient)> <!-- **0..\*** Ingredients, if specified -->

<[**item**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.product.ingredient.item)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)|[Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)) Ingredient --></item>

<[**amount**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.product.ingredient.amount)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Amount of ingredient --></amount>

</ingredient>

</product>

<[**package**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.package)> <!-- **0..1** If is a package -->

<[**container**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.package.container)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Kind of container --></container>

<[**content**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.package.content)> <!-- **0..\*** What is in the package -->

<[**item**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.package.content.item)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)) A product in the package --></item>

<[**amount**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-definitions.Medication.package.content.amount)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Amount in the package --></amount>

</content>

</package>

</Medication>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/medication.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/medication.profile.xml)

#### 3.24.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Medication.code | A code that defines the type of a medication | Unknown | No details provided yet |
| Medication.kind | Whether the medication is a product or a package | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/medication-kind](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-kind) |
| Medication.product.form | The form of a medication | Unknown | No details provided yet |
| Medication.package.container | Kind of container a medication package is packaged in | Unknown | No details provided yet |

### 3.24.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| code : token | References to std. medication terminologies | Medication.code |
| container : token | Kind of container | Medication.package.container |
| content : reference | A product in the package | Medication.package.content.item |
| form : token | Powder | tablets | carton etc. | Medication.product.form |
| ingredient : reference | Ingredient | Medication.product.ingredient.item |
| manufacturer : reference | Manufacturer of the item | Medication.manufacturer |
| name : string | Common / Commercial name | Medication.name |

## 3.25: Resource Definition: MedicationAdministration

Describes the event of a patient being given a dose of a medication. This may be as simple as swallowing a tablet or it may be a long running infusion. Related resources tie this event to the authorizing prescription, and the specific encounter between patient and health care practitioner.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /medicationadministration/

|  |  |
| --- | --- |
| [MedicationPrescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription) | An order for both supply of the medication and the instructions for administration of the medicine to a patient. |
| [MedicationDispense (§3.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense) | Provision of a supply of a medication with the intention that it is subsequently consumed by a patient (usually in response to a prescription). |
| MedicationAdministration | When a patient actually consumes a medicine, or it is otherwise administered to them |
| [MedicationStatement (§3.28)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement) | This is a record of medication being taken by a patient, or that the medication has been given to a patient where the record is the result of a report from the patient, or another clinician. A medication statement is not a part of the prescribe->dispense->administer sequence but is a report that such a sequence (or at least a part of it) did take place resulting in a belief that the patient has received a particular medication. |

For further background information, see the V3 Pharmacy Domain model PORX\_ST040110UV.

### 3.25.1: Resource Content

See also the [Examples (§4.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministrationEx) and the [Definitions (§5.31)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministrationDefn).

<[**MedicationAdministration**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) External Identifier --></identifier>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Administration event status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-admin-status) -->

<[**patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.patient)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Patient --></patient>

<[**practitioner**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.practitioner)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Practitioner (responsible Health Care professional) --></practitioner>

<[**encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.encounter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)) Current Encounter / Admission --></encounter>

<[**prescription**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.prescription)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([MedicationPrescription](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription.MedicationPrescription)) Prescription --></prescription>

<[**wasNotGiven**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.wasNotGiven) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Is event negated -->

<[**reasonNotGiven**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.reasonNotGiven)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Reason event is negated --></reasonNotGiven>

<[**whenGiven**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.whenGiven)><!-- **1..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Effective time --></whenGiven>

<[**medication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.medication)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)) Medication --></medication>

<[**administrationDevice**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.administrationDevice)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Administration device --></administrationDevice>

<[**dosage**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.dosage)> <!-- **0..\*** Medicine administration instructions to the patient/carer -->

<[**timing**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.dosage.timing)><!-- **0..1** [Schedule](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule) Medication timing --></timing>

<[**site**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.dosage.site)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Entry site --></site>

<[**route**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.dosage.route)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Rout of administration --></route>

<[**method**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.dosage.method)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Administration method --></method>

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.dosage.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Dose quantity per dose --></quantity>

<[**rate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.dosage.rate)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Dose quantity per unit of time --></rate>

<[**maxDosePerPeriod**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration-definitions.MedicationAdministration.dosage.maxDosePerPeriod)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Total dose that should be consumed per unit of time --></maxDosePerPeriod>

</dosage>

</MedicationAdministration>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/medicationadministration.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/medicationadministration.profile.xml)

#### 3.25.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| MedicationAdministration.status | A set of codes indicating the current status of a MedicationAdministration | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/medication-admin-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-admin-status) |
| MedicationAdministration.reasonNotGiven | A set of codes indicating the reason why the MedicationAdministration is negated. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationAdministration.dosage.site | Identifies the site where the medicine enters the body | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationAdministration.dosage.route | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationAdministration.dosage.method | A set of codes indicating the method by which the medication is introduced into or onto the body. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |

#### 3.25.1.2: Constraints

* On MedicationAdministration.dosage: Must have at least one of dosage.quantity and dosage.rate (xpath on f:MedicationAdministration/f:dosage: exists(f:quantity) or exists(f:rate))

### 3.25.2: Known Issues

|  |  |
| --- | --- |
| **Issue** | **Comments** |
| Medication Resource | A medication will typically be referred to by means of a code drawn from a suitable Medicines Terminology. However on occasion a product will be required for which the "recipe" must be specified. This implies a requirement to deal with a choice of either a code or a much more complete resource. Currently that resource has not been created. |
| Encounter | Administration records are usually tied to some wider grouping of care records. Encounter or Episode of Care is a common name for this. The present MedicationAdministration resource (and the other three yet to be built) link to an Encounter as an identifier, but it may be more appropriate for it to be a full resource. |
| Contrast Media | Is this resource adequate for administering contrast media to a patient? |
| Author (accountability) | Authorship (and any other accountability) is assumed to be dealt with by the standard FHIR methods. |

### 3.25.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| administrationdevice : reference | Return administrations with this administration device identity | MedicationAdministration.administrationDevice |
| encounter : reference | Return administrations that share this encounter | MedicationAdministration.encounter |
| identifier : token | Return administrations with this external identity | MedicationAdministration.identifier |
| medicine : reference | Return administrations of this medicine | MedicationAdministration.medication |
| notgiven : token | Administrations that were not made | MedicationAdministration.wasNotGiven |
| patient : reference | The identity of a patient to list administrations for | MedicationAdministration.patient |
| prescription : reference | The identity of a prescription to list administrations from | MedicationAdministration.prescription |
| status : token | MedicationAdministration event status (for example one of active/paused/completed/nullified) | MedicationAdministration.status |
| whengiven : date | Date of administration | MedicationAdministration.whenGiven |

## 3.26: Resource Definition: MedicationDispense

Dispensing a medication to a named patient. This includes a description of the supply provided and the instructions for administering the medication..

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /medicationdispense/

|  |  |
| --- | --- |
| [MedicationPrescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription) | An order for both supply of the medication and the instructions for administration of the medicine to a patient. |
| MedicationDispense | Provision of a supply of a medication with the intention that it is subsequently consumed by a patient (usually in response to a prescription). |
| [MedicationAdministration (§3.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration) | When a patient actually consumes a medicine, or it is otherwise administered to them |
| [MedicationStatement (§3.28)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement) | This is a record of medication being taken by a patient, or that the medication has been given to a patient where the record is the result of a report from the patient, or another clinician. A medication statement is not a part of the prescribe->dispense->administer sequence but is a report that such a sequence (or at least a part of it) did take place resulting in a belief that the patient has received a particular medication. |

The supply and the associated administration instructions may not exactly follow the original order (prescription) either because some details were left for completion at this point in the process, or because the dispenser exercised their clinical judgment to make some appropriate modification.

### 3.26.1: Resource Content

See also the [Examples (§4.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispenseEx) and the [Definitions (§5.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispenseDefn).

<[**MedicationDispense**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) External identifier --></identifier>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Active/Completed/Aborted](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-dispense-status) -->

<[**patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.patient)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Patient --></patient>

<[**dispenser**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispenser)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Dispenser --></dispenser>

<[**authorizingPrescription**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.authorizingPrescription)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([MedicationPrescription](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription.MedicationPrescription)) Medication order that authorises the dispense --></authorizingPrescription>

<[**dispense**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense)> <!-- **0..\*** Medicine supply details -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) External identifier --></identifier>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Active/Completed/Aborted](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-dispense-status) -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.type)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Type of dispense --></type>

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Amount dispensed --></quantity>

<[**medication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.medication)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)) Medication --></medication>

<[**whenPrepared**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.whenPrepared)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Dispensing time --></whenPrepared>

<[**whenHandedOver**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.whenHandedOver)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Handover time --></whenHandedOver>

<[**destination**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.destination)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Where the medication was sent --></destination>

<[**receiver**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.receiver)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who collected the medication --></receiver>

<[**dosage**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage)> <!-- **0..\*** Medicine administration instructions to the patient/carer -->

<[**additionalInstructions[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage.additionalInstructions_x_)><!-- **0..1** [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)|[CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Additional dosage instructions --></additionalInstructions[x]>

<[**timing[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage.timing_x_)><!-- **0..1** [dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)|[Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period)|[Schedule](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule) Medication timing --></timing[x]>

<[**site**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage.site)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Entry site --></site>

<[**route**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage.route)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Rout of administration --></route>

<[**method**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage.method)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Administration method --></method>

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Dose quantity per dose --></quantity>

<[**rate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage.rate)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Dose quantity per unit of time --></rate>

<[**maxDosePerPeriod**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.dispense.dosage.maxDosePerPeriod)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Total dose that should be consumed per unit of time --></maxDosePerPeriod>

</dosage>

</dispense>

<[**substitution**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.substitution)> <!-- **0..1** Deals with substitution of one medicine for another -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.substitution.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Type of substitution --></type>

<[**reason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.substitution.reason)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Why was substitution made --></reason>

<[**responsibleParty**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense-definitions.MedicationDispense.substitution.responsibleParty)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who is responsible for the substitution --></responsibleParty>

</substitution>

</MedicationDispense>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/medicationdispense.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/medicationdispense.profile.xml)

#### 3.26.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| MedicationDispense.status MedicationDispense.dispense.status | A code specifying the state of the dispense event. | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/medication-dispense-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-dispense-status) |
| MedicationDispense.dispense.type | Indicates the type of dispensing event that is performed. Examples include: Trial Fill, Completion of Trial, Partial Fill, Emergency Fill, Samples, etc. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationDispense.dispense.dosage.site | Identifies the site where the medicine enters the body | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationDispense.dispense.dosage.route | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationDispense.dispense.dosage.method | A set of codes indicating the method by which the medication is introduced into or onto the body. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationDispense.substitution.type | A code signifying whether a different drug was dispensed from what was prescribed. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationDispense.substitution.reason | Indicates the reason for the substitution of (or lack of substitution) from what was prescribed. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |

#### 3.26.1.2: Constraints

* On MedicationDispense.dispense: whenHandedOver cannot be before whenPrepared (xpath on f:MedicationDispense/f:dispense: not(exists(f:whenHandedOver/@value)) or not(exists(f:whenPrepared/@value)) or ( f:whenHandedOver/@value >= f:whenPrepared/@value))

### 3.26.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| destination : reference | Return dispenses that should be sent to a specific destination | MedicationDispense.dispense.destination |
| dispenser : reference | Return all dispenses performed by a specific individual | MedicationDispense.dispenser |
| identifier : token | Return dispenses with this external identity | MedicationDispense.identifier |
| medicine : reference | Returns dispenses of this medicine | MedicationDispense.dispense.medication |
| patient : reference | The identity of a patient to list dispenses for | MedicationDispense.patient |
| prescription : reference | The identity of a prescription to list dispenses from | MedicationDispense.authorizingPrescription |
| responsibleparty : reference | Return all dispenses with the specified responsible party | MedicationDispense.substitution.responsibleParty |
| status : token | Status of the dispense | MedicationDispense.dispense.status |
| type : token | Return all dispenses of a specific type | MedicationDispense.dispense.type |
| whenhandedover : date | Date when medication handed over to patient (outpatient setting), or supplied to ward or clinic (inpatient setting) | MedicationDispense.dispense.whenHandedOver |
| whenprepared : date | Date when medication prepared | MedicationDispense.dispense.whenPrepared |

## 3.27: Resource Definition: MedicationPrescription

An order for both supply of the medication and the instructions for administration of the medicine to a patient..

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /medicationprescription/

|  |  |
| --- | --- |
| MedicationPrescription | An order for both supply of the medication and the instructions for administration of the medicine to a patient. |
| [MedicationDispense (§3.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense) | Provision of a supply of a medication with the intention that it is subsequently consumed by a patient (usually in response to a prescription). |
| [MedicationAdministration (§3.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration) | When a patient actually consumes a medicine, or it is otherwise administered to them |
| [MedicationStatement (§3.28)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement) | This is a record of medication being taken by a patient, or that the medication has been given to a patient where the record is the result of a report from the patient, or another clinician. A medication statement is not a part of the prescribe->dispense->administer sequence but is a report that such a sequence (or at least a part of it) did take place resulting in a belief that the patient has received a particular medication. |

### 3.27.1: Resource Content

See also the [Examples (§4.31)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescriptionEx) and the [Definitions (§5.33)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescriptionDefn).

<[**MedicationPrescription**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) External identifier --></identifier>

<[**dateWritten**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dateWritten) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Prescription date -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [active | paused | completed | nullified](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-prescription-status) -->

<[**patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.patient)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Patient --></patient>

<[**prescriber**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.prescriber)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Prescriber --></prescriber>

<[**encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.encounter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)) Encounter / Admission / Stay --></encounter>

<[**reasonForPrescribing[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.reasonForPrescribing_x_)><!-- **0..1** [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)|[CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Reason or indication for writing the prescription --></reasonForPrescribing[x]>

<[**medication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.medication)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)) Medication to be taken --></medication>

<[**dosageInstructions**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions)> <!-- **0..\*** Dosage instructions -->

<[**dosageInstructionsText**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.dosageInstructionsText) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Dosage text -->

<[**additionalInstructions[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.additionalInstructions_x_)><!-- **0..1** [string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)|[CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Additional dosage instructions --></additionalInstructions[x]>

<[**timing[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.timing_x_)><!-- **0..1** [dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)|[Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period)|[Schedule](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule) Medication timing --></timing[x]>

<[**site**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.site)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Entry site --></site>

<[**route**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.route)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Route of administration --></route>

<[**method**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.method)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Administration method --></method>

<[**doseQuantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.doseQuantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Dose quantity per dose --></doseQuantity>

<[**rate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.rate)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Dose quantity per unit of time --></rate>

<[**maxDosePerPeriod**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dosageInstructions.maxDosePerPeriod)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Total dose that should be consumed per unit of time --></maxDosePerPeriod>

</dosageInstructions>

<[**dispense**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dispense)> <!-- **0..1** Dispense request -->

<[**medication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dispense.medication)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)) Medication to be dispensed --></medication>

<[**validityPeriod**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dispense.validityPeriod)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Validity period --></validityPeriod>

<[**numberOfRepeatsAllowed**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dispense.numberOfRepeatsAllowed) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of repeats allowed -->

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dispense.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Quantity --></quantity>

<[**expectedSupplyDuration**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.dispense.expectedSupplyDuration)><!-- **0..1** [Duration](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Duration) Expected supply duration --></expectedSupplyDuration>

</dispense>

<[**substitution**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.substitution)> <!-- **0..1** Deals with substitution of one medicine for another -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.substitution.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Type of substitution --></type>

<[**reason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-definitions.MedicationPrescription.substitution.reason)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Why should substitution (not) be made --></reason>

</substitution>

</MedicationPrescription>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/medicationprescription.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/medicationprescription.profile.xml)

#### 3.27.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| MedicationPrescription.status | A code specifying the state of the prescribing event. | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/medication-prescription-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-prescription-status) |
| MedicationPrescription.dosageInstructions.site | Identifies the site where the medicine enters the body | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationPrescription.dosageInstructions.route | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationPrescription.dosageInstructions.method | A set of codes indicating the method by which the medication is introduced into or onto the body. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationPrescription.substitution.type | A code signifying whether a different drug should be dispensed from what was prescribed. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationPrescription.substitution.reason | Indicates the reason that a different medication should (or should not) be substituted from what was prescribed. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |

### 3.27.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| datewritten : date | Return prescriptions written on this date | MedicationPrescription.dateWritten |
| encounter : reference | Return prescriptions with this encounter identity | MedicationPrescription.encounter |
| identifier : token | Return prescriptions with this external identity | MedicationPrescription.identifier |
| medicine : reference | Code for medicine or text in medicine name | MedicationPrescription.medication |
| patient : reference | The identity of a patient to list dispenses for | MedicationPrescription.patient |
| status : token | Status of the prescription | MedicationPrescription.status |

## 3.28: Resource Definition: MedicationStatement

A record of medication being taken by a patient, or that the medication has been given to a patient where the record is the result of a report from the patient, or another clinician.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /medicationstatement/

|  |  |
| --- | --- |
| [MedicationPrescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription) | An order for both supply of the medication and the instructions for administration of the medicine to a patient. |
| [MedicationDispense (§3.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense) | Provision of a supply of a medication with the intention that it is subsequently consumed by a patient (usually in response to a prescription). |
| [MedicationAdministration (§3.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration) | When a patient actually consumes a medicine, or it is otherwise administered to them |
| MedicationStatement | This is a record of medication being taken by a patient, or that the medication has been given to a patient where the record is the result of a report from the patient, or another clinician. A medication statement is not a part of the prescribe->dispense->administer sequence but is a report that such a sequence (or at least a part of it) did take place resulting in a belief that the patient has received a particular medication. |

This resource is distinct from [MedicationPrescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription), [MedicationDispense (§3.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense) and [MedicationAdministration (§3.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration). Each of those resources refer to specific events - an individual order, an individual provisioning of medication or an individual dosing. MedicationStatement is a broader assertion covering a wider timespan and independent of specific events. The existence of resource instances of any of the preceding three types may be used to infer a Medication statement. However, medication statements can also be captured on the basis of other information including an assertion by the patient or a care-giver, the results of a lab test, etc.

Common usage includes

* the recording of non-prescription and/or recreational drugs
* the recording of an intake medication list upon admission to hospital
* the summarization of a patient's "active medications" in a patient profile

### 3.28.1: Resource Content

See also the [Examples (§4.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatementEx) and the [Definitions (§5.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatementDefn).

<[**MedicationStatement**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) External Identifier --></identifier>

<[**patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.patient)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Patient --></patient>

<[**wasNotGiven**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.wasNotGiven) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Is event negated -->

<[**reasonNotGiven**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.reasonNotGiven)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Reason event is negated --></reasonNotGiven>

<[**whenGiven**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.whenGiven)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Effective time --></whenGiven>

<[**medication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.medication)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)) Medication --></medication>

<[**administrationDevice**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.administrationDevice)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Administration device --></administrationDevice>

<[**dosage**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.dosage)> <!-- **0..\*** Medicine administration instructions to the patient/carer -->

<[**timing**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.dosage.timing)><!-- **0..1** [Schedule](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule) Medication timing --></timing>

<[**site**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.dosage.site)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Entry site --></site>

<[**route**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.dosage.route)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Rout of administration --></route>

<[**method**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.dosage.method)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Administration method --></method>

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.dosage.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Dose quantity per dose --></quantity>

<[**rate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.dosage.rate)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Dose quantity per unit of time --></rate>

<[**maxDosePerPeriod**](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement-definitions.MedicationStatement.dosage.maxDosePerPeriod)><!-- **0..1** [Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio) Total dose that should be consumed per unit of time --></maxDosePerPeriod>

</dosage>

</MedicationStatement>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/medicationstatement.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/medicationstatement.profile.xml)

#### 3.28.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| MedicationStatement.reasonNotGiven | A set of codes indicating the reason why the MedicationAdministration is negated. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationStatement.dosage.site | Identifies the site where the medicine enters the body | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationStatement.dosage.route | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| MedicationStatement.dosage.method | A set of codes indicating the method by which the medication is introduced into or onto the body. | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |

### 3.28.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| administrationDevice : reference | Return administrations with this administration device identity | MedicationStatement.administrationDevice |
| identifier : token | Return administrations with this external identity | MedicationStatement.identifier |
| medicine : reference | Code for medicine or text in medicine name | MedicationStatement.medication |
| patient : reference | The identity of a patient to list administrations for | MedicationStatement.patient |
| whengiven : date | Date of administration | MedicationStatement.whenGiven |

## 3.29: Resource Definition: Observation

Simple assertions and measurements made about a patient, device or other subject.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /observation/

Observations are a central element in healthcare, used to support diagnosis, monitor progress, determine baselines and patterns and even capture demographic characteristics. Fundamentally, observations are simple name/value pair assertions with little structure, though there are several resources such as [DiagnosticReport (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport) to manage and represent rich aggregation patterns for observations. Expected uses for this resource include:

* Vital signs: temperature, blood pressure, respiration rate
* Laboratory Data and other Diagnostic Measures
* Measurements emitted by Devices
* Clinical assessments such as APGAR
* Personal characteristics: height, weight, eye-color
* Diagnoses (Note: track-able conditions, allergies, adverse reactions and more complex structures are handled elsewhere)
* Social history: tobacco use, family supports, cognitive status
* Core characteristics: pregnancy status, death assertion

### 3.29.1: Resource Content

See also the [Examples (§4.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observationEx) and the [Definitions (§5.36)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observationDefn).

<[**Observation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation) xmlns="http://hl7.org/fhir">

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.name)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Kind of observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-codes) --></name>

<[**value[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.value_x_)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity)|[CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept)|[Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment)|[Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio)|

[Choice](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Choice)|[Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period)|[SampledData](http://hl7.org/implement/standards/fhir/fhir-book.htm#sampleddata.SampledData)|[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) Actual result --></value[x]>

<[**interpretation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.interpretation)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [High, low, normal, etc.](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-interpretation) --></interpretation>

<[**comments**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.comments) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Comments about result -->

<[**applies[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.applies_x_)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period)|[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime) Relevant time/time-period --></applies[x]>

<[**issued**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.issued) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **0..1** Date/Time this was made available -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Registered|Interim|Final|Amended|Cancelled|Withdrawn](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) -->

<[**reliability**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.reliability) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [If quality issues exist (mostly devices)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-reliability) -->

<[**bodySite**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.bodySite)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Observed body part](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) --></bodySite>

<[**method**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.method)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [How it was done](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-methods) --></method>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Observation id --></identifier>

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who/what this is about --></subject>

<[**performer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.performer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)|[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Who did the observation --></performer>

<[**referenceRange**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.referenceRange)> <!-- **0..\*** Provides guide for interpretation -->

<[**meaning**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.referenceRange.meaning)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [The meaning of this range](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-referencerange-meaning) --></meaning>

<[**range[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.referenceRange.range_x_)><!-- **1..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity)|[Range](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Range)|[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) Reference --></range[x]>

</referenceRange>

<[**component**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.component)> <!-- **0..\*** Component observation -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.component.name)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Kind of component observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-codes) --></name>

<[**value[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-definitions.Observation.component.value_x_)><!-- **1..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity)|[CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept)|[Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment)|[Ratio](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Ratio)|

[Choice](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Choice)|[Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period)|[SampledData](http://hl7.org/implement/standards/fhir/fhir-book.htm#sampleddata.SampledData)|[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string) Actual component result --></value[x]>

</component>

</Observation>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/observation.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/observation.profile.xml)

#### 3.29.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Observation.name Observation.component.name | Codes identifying types of simple observations | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/observation-codes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-codes) |
| Observation.interpretation | Codes identifying interpretations of observations | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/observation-interpretation (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-interpretation) |
| Observation.status | Codes providing the status of an observation | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/observation-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) |
| Observation.reliability | Codes that provide reliability information about an observation | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/observation-reliability](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-reliability) |
| Observation.bodySite | Codes describing anatomical locations. May include laterality | Example | [http://hl7.org/fhir/vs/body-site (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) |
| Observation.method | Methods for simple observations | Example | [http://hl7.org/fhir/vs/observation-methods (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-methods) |
| Observation.referenceRange.meaning | Code for the meaning of a reference range | Example | [http://hl7.org/fhir/vs/referencerange-meaning (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-referencerange-meaning) |

#### 3.29.1.2: Constraints

* Can only have normal range if value is a quantity (xpath: exists(f:valueQuantity) or not(exists(f:normalRange)))
* Must have at least one of value or components (xpath: exists(\*[starts-with(local-name(.), 'value')]) or exists(f:component))

### 3.29.2: Notes:

* The element that contains the actual value of the result has a variable name depending on the type. The name is "value" + the type name, ignoring parameters, with a capital on the first letter, e.g. valueInterval or valueString
* The obtainedDateTime or obtainedPeriod is the time that the observation is most relevant as an observation of the subject. For a biological subject (e.g. a human patient), this is the physiologically relevant time of the observation. In the case of an observation on a specimen, this represents the start and end of the specimen collection (which may include multiple specimens). In the case of an observation obtained directly from a subject (e.g., BP, Chest X-ray), this represent the start and end time of the observation process.
* At its simplest, these resource instances can consist of only a type and a value. The relevance of other properties will vary based on the type of observation. Normal range may be useful for systolic blood pressure, but has little relevance for something like "pregnancy status"
* Profiles will be created to provide guidance on capturing certain types of simple observations. This resource focuses on the level of detail captured by most systems. However, any "simple" observation can easily be broken into numerous components and sub-components to provide additional information relevant in certain circumstances. As with other resources, extensions can be used to introduce this additional complexity.

### 3.29.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| date : date | obtained date/time. If obtained is a period, a date that falls in the period | Observation.applies[x] |
| name : token | The name of the observation type or component type | Observation.name |
| name-value : composite | Both name and value |  |
| performer : reference | who/what performed the observation | Observation.performer |
| reliability : token | The reliability of the observation | Observation.reliability |
| status : token | The status of the observation | Observation.status |
| subject : reference | The subject that the observation is about | Observation.subject |
| value : token | The code or value of a result | Observation.value[x] |

## 3.30: Resource Definition: OperationOutcome

A collection of Error, warning or information messages that result from a system action.

Operation Outcomes are sets of error, warning and information messages that provide detailed information about the outcome of some attempted system operation. They are provided as a direct system response, or component of one, where they provide information about the outcome of the operation.

Specifically, OperationOutcomes are used in the following circumstances:

* When an [RESTful operation](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.operations), fails
* As the response on a [validation operation (§2.1.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.validate), to provide information about the outcomes
* As part of a message response, usually when the message has not been processed correctly

### 3.30.1: Resource Content

See also the [Examples (§4.35)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcomeEx) and the [Definitions (§5.37)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcomeDefn).

<[**OperationOutcome**](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome-definitions.OperationOutcome) xmlns="http://hl7.org/fhir">

<[**issue**](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome-definitions.OperationOutcome.issue)> <!-- **1..\*** A single issue associated with the action -->

<[**severity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome-definitions.OperationOutcome.issue.severity) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [error | warning | information](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-severity) -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome-definitions.OperationOutcome.issue.type)><!-- **0..1** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) [Error or warning code](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-type) --></type>

<[**details**](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome-definitions.OperationOutcome.issue.details) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Additional description of the issue -->

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome-definitions.OperationOutcome.issue.location) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** XPath of element(s) related to issue -->

</issue>

</OperationOutcome>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/operationoutcome.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/operationoutcome.profile.xml)

#### 3.30.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| OperationOutcome.issue.severity | How the issue affects the success of the action | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/issue-severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-severity) |
| OperationOutcome.issue.type | A coded expression of the type of issue | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/issue-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-type) |

### 3.30.2: Using Operation Outcome Resources

On the RESTful interface, operation outcome resources are only relevant when a level of computable detail is required that is more granular than that provided by the HTTP response codes. This granularity could include:

* more detail about the location of an issue
* the ability to identify multiple distinct issues
* the need to drive automated behavior at a more detailed level than supported by HTTP codes

Operation outcomes returned SHOULD be in alignment with the HTTP response code. For example, if the HTTP code indicates a failure (300+), at least one of the issues should have a severity of "error", indicating the reason for the failure.

### 3.30.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |

## 3.31: Resource Definition: Order

A request to perform an action.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /order/

An order resource describes an order that an action be performed. An order is expected to lead to one or more [responses (§3.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse) that describe the outcome of processing/handling the order. The order resource is focused on the process of actually requesting an action be performed; the actual action to be performed is detailed in a separate resource that contains the details. Note that orders are often called "requests", but this name is not used here since the word "request" is used differently elsewhere in this specification.

Note that there is a variety of processes associated with making and processing orders. Some orders may be handled immediately by automated systems but most require real world actions by one or more humans. Some orders can only be processed when other real world actions happen, such as a patient actually presenting themselves so that the action to be performed. Often these real world dependencies are only implicit in the order details.

### 3.31.1: Separation of Order and Order details

In healthcare, information that a particular action has been requested is often widely disseminated throughout the context of a patient's healthcare. For example, the patient’s healthcare record will often include a list of prescriptions that have been made for the patient. For this reason, the presence of a prescription record itself is not enough to create an obligation for a dispense to occur. Most other things that can be ordered follow this same pattern.

For this reason, the information about what is requested is separated from the actual request for an action to be taken. The various workflows around the actual order/fulfillment process are associated with this resource and the [order response (§3.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse) resource, while the details of what is actually ordered are delegated to other resources.

### 3.31.2: Using Orders in a RESTful context

In a RESTful context, a server functions as a repository of requests. When the server accepts the order, it has only stored the order; there is no direct response to the order. Some other process detects the existence of the order, processes it, and creates one or more responses as the order is processed. Usually, these responses are made available on the same server as the order, so that the client can monitor the result of the original order.

A client can determine that an order has not been performed by searching for order resources with no matching responses (see below)

### 3.31.3: Using Orders with messaging

Two message types are defined for sending orders: synchronous and asynchronous.

In a synchronous message, an order message (i.e. a [bundle (§1.2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.bundle) with a [message (§2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message) resource, an order resource and a details resource) is sent to a system, and it responds with a message that includes the [response (§3.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse) (a message resource, and order response resource, along with additional details as appropriate). This synchronous message exchange is simple, but only useful where there only needs to be one response, and where the response can be made in a timely fashion.

For more general use, an asynchronous message type is also defined. With this type, the requesting system sends the order message, and receives a simple acknowledgement message (only a message resource) that acknowledges that the order was received. Then the receiving system sends one or more response messages as the order is processed. Each of these response messages is sent back to the originating system, which also acknowledges receipt of these messages with an acknowledgement message.

### 3.31.4: Using orders in a other contexts

There are a wide variety of ways to implement Order/Order response. The Order and Order response resources are special resources created to manage behaviour in a RESTful or messaging context. In other contexts, such as a Service based environment, there may be alternate methods for managing this behavior that are more appropriate, and there is no need to use Order/Order Response in these contexts.

### 3.31.5: Resource Content

See also the [Examples (§4.36)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderEx) and the [Definitions (§5.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderDefn).

<[**Order**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order) xmlns="http://hl7.org/fhir">

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When the order was made -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Patient this order is about --></subject>

<[**source**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.source)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who initiated the order --></source>

<[**target**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.target)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who is intended to fulfill the order --></target>

<[**reason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.reason) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Text - why the order was made -->

<[**authority**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.authority)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) If required by policy --></authority>

<[**when**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.when)> <!-- **0..1** When order should be fulfilled -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.when.code)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Code specifies when request should be done. The code may simply be a priority code --></code>

<[**schedule**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.when.schedule)><!-- **0..1** [Schedule](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule) A formal schedule --></schedule>

</when>

<[**detail**](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-definitions.Order.detail)><!-- **1..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) What action is being ordered --></detail>

</Order>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/order.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/order.profile.xml)

#### 3.31.5.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Order.when.code | When a requested action should be performed | Unknown | No details provided yet |

#### 3.31.5.2: Constraints

* On Order.when: Provide a code or a schedule, but not both (xpath on f:Order/f:when: exists(f:code) != exists(f:schedule))

### 3.31.6: Processing Order Details

Each request includes one or more *detail* elements that specify what is being ordered. The following kind of orders can be made:

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Order Resource** | **Response Resources** | **Notes** |
| Request for Diagnostic Investigation | [DiagnosticOrder (§3.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder) | 0..\* [DiagnosticReport (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic) | Local work flow arrangements will determine whether the laboratory handles a request by waiting for a specimen, or for the patient, or by visiting the patient directly to obtain the specimen (i.e. phlebotomy ward round) |
| Order to supply a prescription | [MedicationPrescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription) | 0..\* [MedicationAdministration (§3.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration) or [MedicationDispense (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispence) |  |
| Transfer of care from one practitioner to another | Referral (Resource not yet developed) | n/a |  |

Note that a resource may only be used for the order details if the resource type explicitly defines how it is known to be something requested, as opposed to (for instance) something that has happened. For some resources, such as a prescription, this is defined to be always true, while other resources may have some kind of status element for this purpose. If the resource type does not explicitly define this, then it cannot be the target of an order.

### 3.31.7: Auction Protocol

The order and response resources can be used in an auction context, where the order will actually be offered to multiple service providers and then fulfilled by a single provider based on some criteria determined from their responses. The auction protocol may be implemented explicitly by the end user and provider of the order/response, or, in some cases, it may be implemented (partially) transparently by a broker system that sits between them.

In the auction protocol, the order is created without a specified target provider that is intended to fulfill the order. This order is passed to multiple target systems that provide a response based on the service and cost they are prepared to provide. The source or broker selects a preferred provider based on the information provided, updates the target provider on the order and then updates the order in the repository or resends it to the original target systems, which know whether or not they are the winner of the auction by the target system value.

### 3.31.8: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| authority : reference | If required by policy | Order.authority |
| date : date | When the order was made | Order.date |
| detail : reference | What action is being ordered | Order.detail |
| source : reference | Who initiated the order | Order.source |
| subject : reference | Patient this order is about | Order.subject |
| target : reference | Who is intended to fulfill the order | Order.target |
| when : date | A formal schedule | Order.when.schedule |
| when\_code : token | Code specifies when request should be done. The code may simply be a priority code | Order.when.code |

## 3.32: Resource Definition: OrderResponse

A Response to an order.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /orderresponse/

The response to an order indicates the outcome of processing the order itself - whether it was accepted or rejected, or is still in process. The order response resource does not itself convey or represent information that arises as a result of performing the actual order, but it may have references to other resources that do have this information, in order to link between the original order and its outcome.

There may be multiple responses for a given order. For some requests, a responding system may issue a sequence of responses, where each response replaces previous responses as the original order is processed/performed. In these cases, each response should have the same logical identity, and the multiple responses are different versions of the same overall response.

If there are multiple systems responding to the request, or if there request may have multiple different responses, then the different logical responses should have different logical ids.

### 3.32.1: Resource Content

See also the [Examples (§4.37)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponseEx) and the [Definitions (§5.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponseDefn).

<[**OrderResponse**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse) xmlns="http://hl7.org/fhir">

<[**request**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse.request)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Order](http://hl7.org/implement/standards/fhir/fhir-book.htm#order.Order)) The order this is a response to --></request>

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When the response was made -->

<[**who**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse.who)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Who made the response --></who>

<[**authority**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse.authority)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) If required by policy --></authority>

<[**cost**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse.cost)><!-- **0..1** [Money](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Money) How much the request will/did cost --></cost>

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [The status of the response](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-outcome-code) -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Additional description of the response -->

<[**fulfillment**](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse-definitions.OrderResponse.fulfillment)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Details of the outcome of performing the order --></fulfillment>

</OrderResponse>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/orderresponse.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/orderresponse.profile.xml)

#### 3.32.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| OrderResponse.code | The status of the response to an order | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/order-outcome-code](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-outcome-code) |

### 3.32.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| authority : reference | If required by policy | OrderResponse.authority |
| code : token | The status of the response | OrderResponse.code |
| cost : integer | How much the request will/did cost | OrderResponse.cost |
| date : date | When the response was made | OrderResponse.date |
| fulfillment : reference | Details of the outcome of performing the order | OrderResponse.fulfillment |
| request : reference | The order this is a response to | OrderResponse.request |
| who : reference | Who made the response | OrderResponse.who |

## 3.33: Resource Definition: Organization

A formally or informally recognized grouping of people or organizations formed for the purpose of achieving some form of collective action. Includes companies, institutions, corporations, departments, community groups, healthcare practice groups, etc.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /organization/

### 3.33.1: Resource Content

See also the [Examples (§4.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#organizationEx) and the [Definitions (§5.40)](http://hl7.org/implement/standards/fhir/fhir-book.htm#organizationDefn).

<[**Organization**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identifier for this organization --></identifier>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name used for the organization -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.type)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Kind of organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-organization-type) --></type>

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) A contact detail for the organization --></telecom>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.address)><!-- **0..\*** [Address](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address) An address for the organization --></address>

<[**partOf**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.partOf)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) The organization of which this organization forms a part --></partOf>

<[**contact**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.contact)> <!-- **0..\*** Contact for the organization -->

<[**purpose**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.contact.purpose)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [The type of contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-contactentity-type) --></purpose>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.contact.name)><!-- **0..1** [HumanName](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.HumanName) A name associated with the contact --></name>

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.contact.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) Contact details (telephone, email, etc.) for a contact --></telecom>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.contact.address)><!-- **0..1** [Address](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address) Visiting or postal addresses for the contact --></address>

<[**gender**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.contact.gender)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Gender for administrative purposes](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) --></gender>

</contact>

<[**active**](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-definitions.Organization.active) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Whether the organization's record is still in active use -->

</Organization>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/organization.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/organization.profile.xml)

#### 3.33.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Organization.type | Used to categorize the organization | Example | [http://hl7.org/fhir/vs/organization-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-organization-type) |
| Organization.contact.purpose | The purpose for which you would contact a contact party | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/contactentity-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-contactentity-type) |
| Organization.contact.gender | The gender of a person used for administrative purposes | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/administrative-gender (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) |

#### 3.33.1.2: Constraints

* The organization must at least have a name or and id, and possibly more (xpath: count(f:identifier | f:name) > 0)
* On Organization.telecom: The telecom of an organization can never be of use 'home' (xpath on f:Organization/f:telecom: count(f:use[@value='home']) = 0)
* On Organization.address: An address of an organization can never be of use 'home' (xpath on f:Organization/f:address: count(f:use[@value='home']) = 0)

### 3.33.2: Notes:

* The Organization is used for collections of people that have come together to achieve an objective. The [Group (§3.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#group) resource is used to identify a collection of people (or animals, devices, etc.) that are gathered for the purpose of analysis or acting upon, but are not expected to act themselves.
* There are two places for contact information: one on Organization itself and zero or more using the ContactEntity construct. The first one is to be used for the generic, public organization point of contact. The ContactEntity is to be used for reaching a person or party that has been designated by the organization to be contacted for a specific purpose or goal.

### 3.33.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| active : token | Whether the organization's record is active | Organization.active |
| identifier : token | Any identifier for the organization (not the accreditation issuer's identifier) | Organization.identifier |
| name : string | A portion of the Organization's name | Organization.name |
| partof : reference | Search all organizations that are part of the given organization | Organization.partOf |
| phonetic : string | A portion of the Organization's name using some kind of phonetic matching algorithm |  |
| type : token | A code for the type of organization | Organization.type |

## 3.34: Resource Definition: Patient

Demographics and other administrative information about a person or animal receiving care or other health-related services.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /patient/

This Resource covers data about persons and animals involved in a wide range of health-related activities, including:

* Curative activities
* Psychiatric care
* Social services
* Pregnancy care
* Nursing and assisted living
* Dietary services
* Tracking of personal health and exercise data

The data in a Patient Resource is generally kept in the interest of an organization, which also assigns a patient number and is responsible for the upkeep of the patient's record. A person or animal receiving care at multiple organisations will therefore have its information present in multiple Patient Resources. The data in the Resource covers the "who" information about the patient: Its attributes are focused on the demographic information necessary to support the administrative, financial and logistic procedures and does not contain medical or care-related information.

### 3.34.1: Resource Content

See also the [Examples (§4.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patientEx) and the [Definitions (§5.41)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patientDefn).

<[**Patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) An identifier for the person as this patient § --></identifier>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.name)><!-- **0..\*** [HumanName](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.HumanName) A name associated with the patient § --></name>

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) A contact detail for the individual § --></telecom>

<[**gender**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.gender)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Gender for administrative purposes §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) --></gender>

<[**birthDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.birthDate) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** The date and time of birth for the individual § -->

<[**deceased[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.deceased_x_)><!-- **0..1** [boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)|[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime) Indicates if the individual is deceased or not § --></deceased[x]>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.address)><!-- **0..\*** [Address](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address) Addresses for the individual § --></address>

<[**maritalStatus**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.maritalStatus)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Marital (civil) status of a person §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-marital-status) --></maritalStatus>

<[**multipleBirth[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.multipleBirth_x_)><!-- **0..1** [boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)|[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer) Whether patient is part of a multiple birth § --></multipleBirth[x]>

<[**photo**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.photo)><!-- **0..\*** [Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) Image of the person --></photo>

<[**contact**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.contact)> <!-- **0..\*** A contact party (e.g. guardian, partner, friend) for the patient -->

<[**relationship**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.contact.relationship)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [The kind of relationship](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-patient-contact-relationship) --></relationship>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.contact.name)><!-- **0..1** [HumanName](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.HumanName) A name associated with the person --></name>

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.contact.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) A contact detail for the person --></telecom>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.contact.address)><!-- **0..1** [Address](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address) Address for the contact person --></address>

<[**gender**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.contact.gender)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Gender for administrative purposes](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) --></gender>

<[**organization**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.contact.organization)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Organization that is associated with the contact --></organization>

</contact>

<[**animal**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.animal)> <!-- **0..1** If this patient is an animal (non-human) § -->

<[**species**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.animal.species)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [E.g. Dog, Cow §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-species) --></species>

<[**breed**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.animal.breed)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [E.g. Poodle, Angus §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-breeds) --></breed>

<[**genderStatus**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.animal.genderStatus)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [E.g. Neutered, Intact §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-genderstatus) --></genderStatus>

</animal>

<[**communication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.communication)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Languages which may be used to communicate with the patient (http://tools.ietf.org/html/bcp47.htm)](http://tools.ietf.org/html/bcp47.htm)  --></communication>

<[**provider**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.provider)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Organization managing the patient § --></provider>

<[**link**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.link)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Other patient resources linked to this resource § --></link>

<[**active**](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-definitions.Patient.active) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Whether this patient's record is in active use § -->

</Patient>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/patient.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/patient.profile.xml)

#### 3.34.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Patient.gender Patient.contact.gender | The gender of a person used for administrative purposes | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/administrative-gender (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) |
| Patient.maritalStatus | The domestic partnership status of a person | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/marital-status (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-marital-status) |
| Patient.contact.relationship | The nature of the relationship between a patient and a contact person for that patient | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/patient-contact-relationship (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-patient-contact-relationship) |
| Patient.animal.species | The species of an animal | Example | [http://hl7.org/fhir/vs/animal-species (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-species) |
| Patient.animal.breed | The breed of an animal | Example | [http://hl7.org/fhir/vs/animal-breeds (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-breeds) |
| Patient.animal.genderStatus | The state of the animal's reproductive organs | Example | [http://hl7.org/fhir/vs/animal-genderstatus (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-genderstatus) |
| Patient.communication | A human language | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |

#### 3.34.1.2: Constraints

* On Patient.contact: Must at least contain a contact's details or a reference to an organization (xpath on f:Patient/f:contact: f:name or f:telecom or f:address or f:organization)

Notes:

* multipleBirth can be either expressed as a boolean (just indicating whether the patient is part of a multiple birth) or as an integer, indicating the actual birth order.
* Patient records may only be in one of two statuses: in use (active=true) and not in use (active=false). A normal record is active, i.e. it is in use. Active is set to 'false' when a record is created as a duplicate or in error. A record does not need to be linked to be inactivated.
* The *link* element is used to assert that two or more Patient resources are both about the same actual person. See below for further discussion
* There should be only one preferred language (Language.preference = true) per mode of expression.
* The Contact for a Patient has an element *organization*, this is for use with guardians or business related contacts where just the organization is relevant.

### 3.34.2: Managing Patient Registration (Linking Patients)

Managing Patient registration is a well known difficult problem. Around 2% of registrations are in error, mostly duplicate records. Sometimes the duplicate record is caught fairly quickly and retired before much data is accumulated. In other cases, substantial amounts of data may accumulate. For these and other reasons, the identifiers associated with a patient may change over time.

A Patient record's Resource Id can never change. For this reason the identifiers with which humans are concerned (often called MRN - Medical Record Number, or UR - Unit Record) should not be used for the resource' id. Instead they should be represented in the *Patient.identifier* list where they can be managed. This is also useful for the case of institutions that have acquired multiple numbers because of mergers of patient record systems over time.

This specification does not specify merge functionality: if multiple patient records are found to be duplicates, they can be linked together - an assertion that two (or more) Patient resources are both about the same actual person. When patient resources are linked, one may be chosen as the "master" - the correct record. In this case, the active status of all the other resources is set to false, and all the content is moved to the active record by updating it directly.

The *link* element is used to assert that patient resources refer to the same person. If any patient resources is linked to another, then that other resource must also link back to the source resource in order to maintain record consistency. **Systems should not update patient links across two or more patient resources using separate transactions (i.e. update operations), where later operations may fail and leave the patient resources in disagreement with each other**. Instead, systems should either:

* Use a [transaction (§2.1.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.transaction) and update all the resources in a single transaction
* Use a [patient link/unlink (§2.3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message.events) message

### 3.34.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| active : token | Whether the patient record is active |  |
| address : string | an address in any kind of address/part of the patient |  |
| animal-breed : token | the breed for animal patients |  |
| animal-species : token | the species for animal patients |  |
| birthdate : date | the patient's date of birth |  |
| family : string | a portion of the family name of the patient |  |
| gender : token | gender of the patient |  |
| given : string | a portion of the given name of the patient |  |
| identifier : token | A patient identifier |  |
| language : token | language code (irrespective of use value) |  |
| name : string | a portion of either family or given name of the patient |  |
| phonetic : string | a portion of either family or given name using some kind of phonetic matching algorithm |  |
| provider : reference | The identity of the organization at which this person is a patient | Patient.provider |
| telecom : string | the value in any kind of telecom details of the patient |  |

## 3.35: Resource Definition: Picture

An Image used in healthcare. The actual pixels maybe inline or provided by direct reference.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /picture/

The Picture resource is suitable for stills or moving pictures (video).

While it is clear that there needs to be a resource that handles the exchange in pictures, it's not clear whether a resource should be created specifically for this task. In practice, the Picture resource here is a lot like a profile on an [Observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation) using an attachment as a value. In fact, such a [profile is defined (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-profile-picture) for comparison purposes. The FHIR project team is seeking comments on which makes for easier implementation: a resource, or a profile on the observation resource (use community input above).

Alternative question: should this be renamed Media, and include sound recordings? (note what impact this should have on the properties when making comments on this)

### 3.35.1: Resource Content

See also the [Examples (§4.40)](http://hl7.org/implement/standards/fhir/fhir-book.htm#pictureEx) and the [Definitions (§5.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#pictureDefn).

<[**Picture**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture) xmlns="http://hl7.org/fhir">

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Who/What this image is taken of § --></subject>

<[**dateTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.dateTime) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** When the image was taken § -->

<[**operator**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.operator)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) The person who generated the image § --></operator>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identifier for the image § --></identifier>

<[**accessionNo**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.accessionNo)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Used by the requester to link back to the original context § --></accessionNo>

<[**studyId**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.studyId)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) The session in which the picture was taken § --></studyId>

<[**seriesId**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.seriesId)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) The series of images in which this picture was taken § --></seriesId>

<[**method**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.method)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) How the image was taken § --></method>

<[**requester**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.requester)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who asked that this image be collected § --></requester>

<[**modality**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.modality) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Type of the image capturing machinery §](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-type) -->

<[**deviceName**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.deviceName) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name of the manufacturer § -->

<[**height**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.height) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Height of the image § -->

<[**width**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.width) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Width of the image § -->

<[**bits**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.bits) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of bits of colour (2..32) § -->

<[**frames**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.frames) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Number of frames § -->

<[**frameDelay**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.frameDelay)><!-- **0..1** [Duration](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Duration) Length of time between frames § --></frameDelay>

<[**view**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.view)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Imaging view e.g. Lateral or Antero-posterior (AP) § --></view>

<[**content**](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-definitions.Picture.content)><!-- **1..1** [Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) Actual picture - reference or data --></content>

</Picture>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/picture.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/picture.profile.xml)

#### 3.35.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Picture.modality | The type of image in the picture | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/picture-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-type) |

### 3.35.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| accession : token | Used by the requester to link back to the original context | Picture.accessionNo |
| date : date | the date the image was taken | Picture.dateTime |
| identifier : token | the request id for the image | Picture.identifier |
| modality : token | the modality of the image | Picture.modality |
| operator : reference | person who gathered the image | Picture.operator |
| series : token | The series of images in which this picture was taken | Picture.seriesId |
| size : integer | the size of the image in MB - may include > or < in the value |  |
| study : token | The session in which the picture was taken | Picture.studyId |
| subject : reference | Who the image is about | Picture.subject |
| view : token | Imaging view e.g. Lateral or Antero-posterior (AP) | Picture.view |

## 3.36: Resource Definition: Practitioner

Demographics and qualification information for an individual who is directly or indirectly involved in the provisioning of healthcare.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /practitioner/

Practitioner covers all individuals who are engaged in the healthcare process and healthcare-related services as part of their formal responsibilities and this Resource is used for attribution of activities and responsibilities to these individuals. Practitioners include (but are not limited to):

* physicians, dentists, pharmacists
* physician assistants, nurses, scribes
* midwives, dieticians, therapists, optometrists, paramedics
* medical technicians, laboratory scientists, prosthetic technicians, radiographers
* social workers, professional home carers, official volunteers
* receptionists handling patient registration
* IT personnel merging or unmerging patient records

The Resource must not be used for persons involved without a formal responsibility like individuals taking care for friends, relatives or neighbours. These can be registered as a Patient's Contact.

Practitioner performs different roles within the same or even different organizations. Depending on jurisdiction and custom, it may be necessary to maintain a specific Practitioner Resource for each such role or have a single Practitioner with multiple roles. The role can be limited to a specific period, after which authorization for this role ends. Note that the represented organization need not necessarily be the (direct) employer of a Practitioner.

### 3.36.1: Resource Content

See also the [Examples (§4.41)](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitionerEx) and the [Definitions (§5.43)](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitionerDefn).

<[**Practitioner**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) A identifier for the person as this agent § --></identifier>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.name)><!-- **0..1** [HumanName](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.HumanName) A name associated with the person § --></name>

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) A contact detail for the practitioner § --></telecom>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.address)><!-- **0..1** [Address](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address) One or more addresses for the practitioner § --></address>

<[**gender**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.gender)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Gender for administrative purposes §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) --></gender>

<[**birthDate**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.birthDate) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** The date and time of birth for the practitioner § -->

<[**photo**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.photo)><!-- **0..\*** [Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) Image of the person --></photo>

<[**organization**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.organization)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) The represented organization § --></organization>

<[**role**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.role)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [A role the practitioner has §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-role) --></role>

<[**specialty**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.specialty)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Specific specialty of the practitioner §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-specialty) --></specialty>

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) The period during which the person is authorized to perform the service § --></period>

<[**qualification**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.qualification)> <!-- **0..\*** Qualifications relevant to the provided service -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.qualification.code)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Qualification --></code>

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.qualification.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Period during which the qualification is valid --></period>

<[**issuer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.qualification.issuer)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization.Organization)) Organization that regulates and issues the qualification --></issuer>

</qualification>

<[**communication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-definitions.Practitioner.communication)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [A language the practitioner is able to use in patient communication (http://tools.ietf.org/html/bcp47.htm)](http://tools.ietf.org/html/bcp47.htm)  --></communication>

</Practitioner>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/practitioner.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/practitioner.profile.xml)

#### 3.36.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Practitioner.gender | The gender of a person used for administrative purposes | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/administrative-gender (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) |
| Practitioner.role | The role a person plays representing an organization | Example | [http://hl7.org/fhir/vs/practitioner-role (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-role) |
| Practitioner.specialty | Specific specialty associated with the agency | Example | [http://hl7.org/fhir/vs/practitioner-specialty (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-specialty) |
| Practitioner.qualification.code | Specific qualification the practitioner has to provide a service | Unknown | No details provided yet |
| Practitioner.communication | A human language | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |

### 3.36.2: Notes:

* Practitioner.organization is optional, so it can be used to represent self-employed professionals.

### 3.36.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| address : string | an address in any kind of address/part | Practitioner.address |
| family : string | a portion of the family name | Practitioner.name |
| gender : token | gender of the practitioner | Practitioner.gender |
| given : string | a portion of the given name | Practitioner.name |
| identifier : token | A practitioner's Identifier | Practitioner.identifier |
| name : string | a portion of either family or given name | Practitioner.name |
| organization : reference | The identity of the organization the practitioner represents / acts on behalf of | Practitioner.organization |
| phonetic : string | a portion of either family or given name using some kind of phonetic matching algorithm | Practitioner.name |
| telecom : string | the value in any kind of contact | Practitioner.telecom |

## 3.37: Resource Definition: Procedure

An action that is performed on a patient. This can be a physical 'thing' like an operation, or less invasive like counselling or hypnotherapy.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /procedure/

An Act whose immediate and primary outcome (post-condition) is the alteration of the physical condition of the subject. Used to record the details of procedures performed on a patient. This includes surgical procedures, diagnostic procedures, endoscopic procedures, biopsies. It excludes things for which there are specific resources, such as immunizations, drug administrations

### 3.37.1: Resource Content

See also the [Examples (§4.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedureEx) and the [Definitions (§5.44)](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedureDefn).

<[**Procedure**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure) xmlns="http://hl7.org/fhir">

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Subject of this procedure § --></subject>

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.type)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Identification of the procedure § --></type>

<[**bodySite**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.bodySite)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Precise location details § --></bodySite>

<[**indication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.indication) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Indications for the procedure § -->

<[**performer**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.performer)> <!-- **0..\*** The people who performed the procedure § -->

<[**person**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.performer.person)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) The reference to the practitioner § --></person>

<[**role**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.performer.role)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) The role the person was in § --></role>

</performer>

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.date)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) The date the procedure was performed § --></date>

<[**encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.encounter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)) The encounter during which the procedure was performed § --></encounter>

<[**outcome**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.outcome) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Outcome of the procedure § -->

<[**report**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.report)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([DiagnosticReport](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport.DiagnosticReport)) Any report that results from the procedure --></report>

<[**complication**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.complication) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Complications -->

<[**followUp**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.followUp) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Instructions for follow up -->

<[**relatedItem**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.relatedItem)> <!-- **0..\*** A procedure that is related to this one -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.relatedItem.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [caused-by | caused](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-relationship-type) -->

<[**target**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.relatedItem.target)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Procedure](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure.Procedure)|[MedicationPrescription](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription.MedicationPrescription)) The related item - eg a procedure --></target>

</relatedItem>

<[**notes**](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-definitions.Procedure.notes) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Procedure notes -->

</Procedure>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/procedure.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/procedure.profile.xml)

#### 3.37.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Procedure.relatedItem.type | the nature of the relationship | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/procedure-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-relationship-type) |

**Questions**

* Should there be a separate entry for duration? Currently this is inferred from date if represented as a Period
* Indication is currently a string. What to do if you want to indicate that the procedure is because of a Condition? You could use relatedItem, but is it confusing to have indication in multiple places.
* Should we support a careplan as follow-up?

### 3.37.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| date : date | the date the procedure was performed on | Procedure.date |
| subject : reference | The identity of a patient to list procedures for | Procedure.subject |
| type : token | type of procedure | Procedure.type |

## 3.38: Resource Definition: Profile

A Resource Profile - a statement of use of one or more FHIR Resources. It may include constraints on Resources and Data Types, Terminology Binding Statements and Extension Definitions.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /profile/

This specification describes a set of base resources that are used in many different contexts in healthcare. In order to make this manageable, applications and specifications need to be able to describe restrictions on how one or more resource(s) are used, including defining extensions, and controlling how terminology is used. These descriptions need to be able to be shared through repositories of profile definitions, and need to allow for these usage statements to be published, compared, and used as the basis for code, report and UI generation. All these things are done using a Resource Profile, which itself is a resource.

Profile resources have four main parts:

1. A metadata section the describes the profile, and supports registry searching
2. *Structures* that define and describe how a Resource or Data Type is used
3. *Extension Definitions* that define extensions that can be used in structures
4. *Bindings* that describe a particular way that terminology is used

This page defines the profile resource, and describes how it is used. Note that as part of the specification itself, a [full set of profiles (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#implementation.profiles) for all resources and data types is published.

A FHIR RESTful server serving the profile resource is also a profile repository. HL7 hosts one for public registration of FHIR profiles at (yet to be done).

### 3.38.1: Metadata

The profile resource has a set of metadata that is mostly shared with the [Value Set (§3.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset) and [Conformance (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) resources. The metadata describes the profile, and helps find the profile when registered in profile repositories.

|  |  |
| --- | --- |
| identifier | The identifier that is used to identify this profile when it is referenced in a specification, model, design or an instance (should be globally unique URI, OID, or UUID) |
| version | The identifier that is used to identify this version of the profile when it is referenced in a specification, model, design or instance. This is an arbitrary value managed by the profile author manually and the value should be a timestamp.  Note that there may be multiple resource versions of the profile that have this same identifier. The resource will have updates that create new versions for technical reasons, whereas the stated version number needs to be under the author's control |
| name | A free text natural language name identifying the Profile |
| publisher | Details of the individual or organization who accepts responsibility for publishing the profile. This helps establish the "authority/credibility" of the profile. |
| telecom | Contact details to assist a user in finding and communicating with the publisher |
| description | A free text natural language description of the profile and its use |
| code | A set of terms from external terminologies that may be used to assist with indexing and searching of templates |
| status | The status of the profile Allows filtering of profiles that are appropriate for use vs. not. See the [Status Codes](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-profile-status) |
| experimental | This profile was authored for testing purposes (or education/evaluation/marketing), and is not intended to be used for genuine usage |
| date | The date that this version of the profile was published |
| fhirVersion | The version of the FHIR specification on which this profile is based. It is not necessary to specify the version, as most profiles are valid across multiple versions, and the validity of a profile against a particular version of FHIR can easily be checked by tooling. |

Notes:

* The name of the profile is not required to be globally unique, but the name should have some scoping information (i.e. Acme Inc. (USA), Allergy List)
* Multiple codes may be assigned to the profile. These may either describe the template, the focus of the template or both. They are solely to help find the profile by searching for structured concepts.

### 3.38.2: Structure

This section specifies restrictions on the content of a resource or a data type. Each structure has a name, which as an internal name unique in the scope of the profile that is used to reuse the structure, and the type that it restricts, which is either a resource or data type defined in the FHIR specification. The following kinds of statements can be made about how a resource or data type is used:

* Restricting the cardinality of the element. e.g. the base might allow 0..\*, and a particular application might support 1..2
* Ruling out use of an element by setting its maximum cardinality to 0
* Making additional invariants on the content of nested elements within the resource (expressed as XPath statements)
* Restricting the types for an element that allows multiple types
* Requiring a typed element or the target of a resource reference to conform to a profile declared elsewhere
* Specifying a binding to a different terminology value set
* Providing alternative definitions for the elements defined in a Resource to explain how they are used in the context of the Profile
* Providing more specific or additional mappings (e.g. to v2 or v3) for the resource when used in a particular context

All of these changed definitions must be restrictions that are consistent with the rules defined in the base resource in the FHIR Specification. Note that some of these restrictions can be enforced by tooling (and are by the FHIR tooling), but others cannot be automatically enforced.

A structure definition consists of a linear list of element declarations. The inherent nested structure of the elements is derived from the *path* value of each element. For instance, a sequence of the element paths like this:

* Root
* Root.childA
* Root.childA.grandchild1
* Root.childB

defines the following structure:

<Root>

<childA>

<grandChild/>

</childA>

<childB/>

</Root>

or its JSON equivalent. The structure must be coherent - children are never implied, and the path statements must always be in order. The element list is a linear list rather than being explicitly nested because profile structures are frequently used in multiple places within a single profile, and this re-use is easier in a flat structure.

Profiles are always complete and static. This means that there is never a need to consult any additional profiles to fully understand the element structure that is defined, and there is no need to perform comparison between any profiles to determine the meaning of any profile.

#### 3.38.2.1: Reusing Definitions

todo...

#### 3.38.2.2: Slicing

One common thing in profiles is to take an element that may occur more than once, and describe a series of different restrictions on the elements in the list, and by doing this associate additional meaning with each element, so that the list is split into a series of individual elements or sub-lists. In FHIR, this operation is known as "Slicing" a collection.

Here is an example to illustrate the process:

In this example, the base resource defines the "component" element which may occur multiple times. The profile for Acme, Inc. constrains the component element into 2 different named kinds: an optional systolic and an optional diastolic observation component, which both have a value of type Quantity. Note that to avoid adding clutter to this simplified example, the "type" attribute of Component is shown to be of type code, while its actual definition is CodeableConcept.

Note that the resource is exchanged, and the wire format that is exchanged is not altered by the profile. The item profile names defined in the profile ("systolic", etc. in this list) are never exchanged. A resource instance looks like this:

<Observation>

<component>

<code value="8480-6"/>

<valueQuantity ...>

</component>

<component>

<code value="8462-4"/>

<valueQuantity ...>

</component>

The only way to determine that the first component corresponds to "Systolic" in the profile is to check the values of the elements - in this case, the code element. In order to make this easy to use, particularly in the context of code generation tools that work with profiles, any time slicing is performed in a profile, the profile must nominate a "discriminator" - a child element that is used to discriminate between the different slices. The child element must be associated with a fixed value in each of the definitions, or if the child element has a terminology binding, it must be associated with a complete binding with a version specific [Value Set (§3.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset) reference that enumerates the possible codes in the value set.

TODO: how does the discriminator work with resource references? TODO solicit comments about discriminating only on codes

Within a profile, a slice will mean that there are multiple entries in the element list with the same path, each with a different name. All slices that are grouped together (no short path in the elements between them) must have the same discriminator element in the profile, and each slice must specify a distinct set of possible values for the element so that the different slice can be differentiated. The value of the discriminator is either a simple name - the name of a child element, or an URI, which is identifies an extension that serves as the discriminator.

An additional reason to use slicing is when a single element has a choice of types, and different types need different definitions, mappings, or constraints.

#### 3.38.2.3: Bundles

specifying bundles .. todo

### 3.38.3: Extension Definitions

A profile can also define extensions. Some profiles only define extensions, and others define extensions as part of a defining one or more structures. For an extension definition, the profile defines the code that identifies the extension. The full URI that refers to the extension when it is used in a resource is the identifier (from the metadata above) and then # + the code.

The extension definition also defines the context where the extension can be used (usually a particular path or a data type), and then defines it using the same details used to profile the structural elements.

Note that in the case of a profile that defines an extension, and then uses it, this will mean that there will be duplication between the definition of the extension, and the definitions in the structure where it is used.

#### 3.38.3.1: Using Extensions in Structures

Defining an extension means that it can be used in a resource somewhere. To actually use a resource, the extension list on the resource needs to be sliced. To do this, ... (todo: fill out the details)

Note that the minimum cardinality of an extension must be a valid restriction on the minimum cardinality in the definition of the extension. if the minimum cardinality of the extension is 1 when it is defined, it can only be mandatory when it is added to a profile. This is not recommended - the minimum cardinality of an extension should be 0.

### 3.38.4: Binding Definitions

This section defines a set of bindings. A binding links from an element that may contain a code to a definition of the set of possible codes the element may contain. The binding identifies the definition of the set of possible codes, and controls how tightly the set of the possible codes is interpreted,

The set of possible codes is either a formal reference to a value set resource, which may be version specific, or a general reference to some web content that defines a set of codes. The second is most appropriate where set of values is defined by some external standard (such as mime types). Alternatively, where the binding is incomplete (e.g. under development) just a text description of the possible codes can be provided.

Bindings have two properties that define how the set of codes is used: *isExtensible* and *conformance*.

* **isExtensible** indicates whether additional codes are allowed beyond those in the defined set of codes.

|  |  |
| --- | --- |
| false | No additional codes are to be used beyond the list provided |
| true | Supplemental codes or plain text may be needed (this is usually because it is reasonable think that concepts will need to be used which won't be in the defined set of codes) |

* **Conformance** indicates the expectations for implementers of the specification. There are three possible values:

|  |  |
| --- | --- |
| required | Only codes in the specified set are allowed. If the strength is 'extensible', other codes may be used for concepts not covered by the value set but cannot be used for concepts covered by the bound code list, even if a profile constrains out some of those codes). |
| preferred | For greater interoperability, implementers are strongly encouraged to use the bound set of codes, however alternate codes may be used in profiles if necessary without being considered non-conformant. |
| example | The codes in the set are an example to illustrate the meaning of the field. There is no particular preference for its use. |

The interplay between the meaning of these is subtle but sometimes important. The following table helps define the meanings:

|  |  |  |
| --- | --- | --- |
| **Conformance** | **isExtensible=false** | **isExtensible=true** |
| **Required** | Implementers SHALL use a code from the defined set | Implementers SHALL use a code from the defined set if one is applicable, but otherwise may provide their own code or use text |
| **Preferred** | Implementers SHOULD use a code from the defined set | Implementers SHOULD use a code from the defined set if one is applicable, but MAY provide their own code or use text |
| **Example** | Implementers MAY use a code from the defined set | Implementers MAY use a code from the defined or provide their own code or use text |

A profile can define a set of bindings that it uses directly, or it can define a set of bindings for re-use in other profiles. To use bindings in other profiles, just provide an absolute reference. This is a reference to a binding in the same profile:

<binding value="te:OperationOutcomeSource"/>

This is a reference to a binding in some other profile:

<binding value="http://hl7.org/fhir/tooling/extensions#OperationOutcomeSource"/>

Bindings can reference value sets by version or independent of version. Value sets may themselves reference other value sets as well as code systems by version or independent of version. Unless all references are version-specific, it is possible that the set of codes permitted in the value set could change over time.

### 3.38.5: Resource Content

See also the [Examples (§4.43)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profileEx) and the [Definitions (§5.45)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profileDefn).

<[**Profile**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.identifier) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Logical id to reference this profile § -->

<[**version**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.version) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Logical id for this version of the profile § -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Informal name for this profile § -->

<[**publisher**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.publisher) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name of the publisher (Organization or individual) § -->

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) Contact information of the publisher § --></telecom>

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Natural language description of the profile § -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.code)><!-- **0..\*** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) Assist with indexing and finding § --></code>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [draft | experimental | review | production | withdrawn | superseded §](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-profile-status) -->

<[**experimental**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.experimental) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If for testing purposes, not real usage § -->

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Date for this version of the profile § -->

<[**fhirVersion**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.fhirVersion) value="[[id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id)]"/><!-- **0..1** FHIR Version this profile targets § -->

<[**structure**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure)> <!-- **0..\*** A constraint on a resource or a data type -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [The Resource or Data Type being described](http://hl7.org/implement/standards/fhir/fhir-book.htm#defined-types) -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name for this particular structure (reference target) -->

<[**publish**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.publish) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** This definition is published (i.e. for validation) -->

<[**purpose**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.purpose) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Human summary: why describe this resource? -->

<[**element**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element)> <!-- **0..\*** Definition of elements in the resource (if no profile) -->

<[**path**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.path) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** The path of the element (see the formal definitions) -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name for this particular element definition (reference target) -->

<[**slicing**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.slicing)> <!-- **0..1** This element is sliced - slices follow -->

<[**discriminator**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.slicing.discriminator) value="[[id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id)]"/><!-- **1..1** Element that used to distinguish the slices -->

<[**ordered**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.slicing.ordered) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** If elements must be in same order as slices -->

<[**rules**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.slicing.rules) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Whether slice list is open or closed](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-slicing-rules) -->

</slicing>

<[**definition**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition)> <!-- **0..1** More specific definition of the element -->

<[**short**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.short) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Concise definition for xml presentation -->

<[**formal**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.formal) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Formal definition -->

<[**comments**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.comments) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Comments about the use of this element -->

<[**requirements**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.requirements) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Why is this needed? -->

<[**synonym**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.synonym) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** Other names -->

<[**min**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.min) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **1..1** Minimum Cardinality -->

<[**max**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.max) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Maximum Cardinality (a number or \*) -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.type)> <!-- **0..\*** Type of the element -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.type.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Data type or Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#data-types) -->

<[**profile**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.type.profile) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Profile.structure to apply -->

<[**bundled**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.type.bundled) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If code is a Resource, is it in the bundle? -->

</type>

<[**nameReference**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.nameReference) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** To another element constraint (by element.name) -->

<[**value[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.value_x_)><!-- **0..1** Fixed value: [as defined for type] --></value[x]>

<[**example[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.example_x_)><!-- **0..1** Example value: [as defined for type] --></example[x]>

<[**maxLength**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.maxLength) value="[[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)]"/><!-- **0..1** Length for strings -->

<[**condition**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.condition) value="[[id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id)]"/><!-- **0..\*** Reference to invariant about presence -->

<[**constraint**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.constraint)> <!-- **0..\*** Condition that must evaluate to true -->

<[**key**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.constraint.key) value="[[id](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.id)]"/><!-- **1..1** Target of 'condition' reference above -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.constraint.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Short human label -->

<[**severity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.constraint.severity) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [error | warning](http://hl7.org/implement/standards/fhir/fhir-book.htm#constraint-severity) -->

<[**human**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.constraint.human) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Human description of constraint -->

<[**xpath**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.constraint.xpath) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** XPath expression of constraint -->

<[**ocl**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.constraint.ocl) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** OCL expression of constraint -->

</constraint>

<[**mustSupport**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.mustSupport) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If the element must be usable -->

<[**mustUnderstand**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.mustUnderstand) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If the element must be understood -->

<[**binding**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.binding) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Reference to a binding (local or absolute) -->

<[**mapping**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.mapping)> <!-- **0..\*** Map element to another set of definitions -->

<[**target**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.mapping.target) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Which mapping this is (v2, CDA, openEHR, etc.) -->

<[**map**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.element.definition.mapping.map) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Details of the mapping -->

</mapping>

</definition>

</element>

<[**searchParam**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.searchParam)> <!-- **0..\*** Additional search params defined -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.searchParam.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Name of search parameter -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.searchParam.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [Type of search parameter](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type) -->

<[**documentation**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.structure.searchParam.documentation) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Contents and meaning of search parameter -->

</searchParam>

</structure>

<[**extensionDefn**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.extensionDefn)> <!-- **0..\*** Definition of an extension -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.extensionDefn.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** Identifies the extension in this profile -->

<[**contextType**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.extensionDefn.contextType) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [resource | datatype | mapping | extension](http://hl7.org/implement/standards/fhir/fhir-book.htm#extension-context) -->

<[**context**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.extensionDefn.context) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..\*** Where the extension can be used in instances -->

<[**definition**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.extensionDefn.definition)><!-- **1..1** Content as for Profile.structure.element.definition Definition of the extension and its content --></definition>

</extensionDefn>

<[**binding**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.binding)> <!-- **0..\*** Define code sets for coded elements -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.binding.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Binding name -->

<[**isExtensible**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.binding.isExtensible) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** Can additional codes be used? -->

<[**conformance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.binding.conformance) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [required | preferred | example](http://hl7.org/implement/standards/fhir/fhir-book.htm#binding-conformance) -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.binding.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Human explanation of the binding -->

<[**reference[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-definitions.Profile.binding.reference_x_)><!-- **0..1** [uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)|[Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([ValueSet](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset.ValueSet)) Source of binding content --></reference[x]>

</binding>

</Profile>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/profile.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/profile.profile.xml)

#### 3.38.5.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Profile.status | The lifecycle status of a Resource Profile | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/resource-profile-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-profile-status) |
| Profile.structure.type | Either a resource or a data type | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/defined-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#defined-types) |
| Profile.structure.element.slicing.rules | How slices are interpreted when evaluating an instance | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/resource-slicing-rules](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-slicing-rules) |
| Profile.structure.element.definition.type.code | The type of an element - one of the FHIR data types | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/data-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#data-types) |
| Profile.structure.element.definition.constraint.severity | Must applications comply with this constraint? | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/constraint-severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#constraint-severity) |
| Profile.structure.searchParam.type | Data types allowed to be used for search parameters | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/search-param-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type) |
| Profile.extensionDefn.contextType | How an extension context is interpreted | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/extension-context](http://hl7.org/implement/standards/fhir/fhir-book.htm#extension-context) |
| Profile.binding.conformance | Must applications comply with this binding? | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/binding-conformance](http://hl7.org/implement/standards/fhir/fhir-book.htm#binding-conformance) |

#### 3.38.5.2: Constraints

* Must define at least one resource constraint, extension definition or binding (xpath: exists(f:structure) or exists(f:extensionDefn) or exists(f:binding))
* On Profile.structure: Provide either a profile reference or constraints on the resource elements (but not both) (xpath on f:Profile/f:structure: exists(f:profile) != exists(f:element))
* On Profile.structure: Only complex types can be constrained, not primitive types such as string etc. (xpath on f:Profile/f:structure: upper-case(substring(f:type,1,1))=substring(f:type,1,1))
* On Profile.structure.element.definition: Either a namereference or a fixed value (but not both) is permitted (xpath on f:Profile/f:structure/f:element/f:definition: not(exists(f:nameReference) and exists(f:\*[starts-with(local-name(.), 'value')])))
* On Profile.structure.element.definition: Value may only be specified if the type consists of a single repetition that has a type corresponding to one of the primitive data types. (xpath on f:Profile/f:structure/f:element/f:definition: not(exists(f:\*[starts-with(local-name(.), 'value')])) or (count(f:type)=1 and f:type/f:code[substring(@value,1,1)=lower-case(substring(@value,1,1))]))
* On Profile.structure.element.definition: Binding can only be present for coded elements (xpath on f:Profile/f:structure/f:element/f:definition: not(exists(f:binding)) or f:type/f:code/@value=('code','Coding','CodeableConcept','Quantity'))
* On Profile.structure.element.definition.max: Max must be a number or "\*" (xpath on f:Profile/f:structure/f:element/f:definition/f:max: @value='\*' or (normalize-space(@value)!='' and normalize-space(translate(@value, '0123456789',''))=''))
* On Profile.structure.element.definition.type: Bundled may only be specified if one of the allowed types for the element is a resource (xpath on f:Profile/f:structure/f:element/f:definition/f:type: not(exists(f:bundled)) or exists(f:code[starts-with(@value, 'Resource(')]))
* On Profile.extensionDefn.code: Codes must be unique in the context of a profile (xpath on f:Profile/f:extensionDefn/f:code: count(ancestor::f:Profile/f:extensionDefn/f:code[@value=current()/@value])=1)
* On Profile.binding: provide either a reference or a description (xpath on f:Profile/f:binding: (exists(f:referenceUri) or exists(f:referenceResource)) or exists(f:description) or exists(f:name))
* On Profile.binding: Example value sets are always extensible (xpath on f:Profile/f:binding: not(f:conformance/@value='example' and f:isExtensible.value='false'))
* On Profile.binding.name: Binding name must be unique in the context of a profile (xpath on f:Profile/f:binding/f:name: count(ancestor::f:Profile/f:binding/f:name[@value=current()/@value])=1)
* On Profile.binding.reference[x]: uri must start with http:// or https:// (xpath on f:Profile/f:binding/f:reference[x]: starts-with(@value, 'http:') or starts-with(@value, 'https:'))

### 3.38.6: Interpretation Notes:

* The name of a resource constraint (Profile.structure.name) is only used as a logical target for .element.type.profile. A reference may reference another resource constraint in the same Resource Profile by Profile.resource.name as #[name] or a different resource constraint in another profile by an absolute uri. In the case of an absolute uri, it must resolve literally or logically to a [Resource Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) and specify a #[name] portion in the URI that references a particular constraint in the target profile by name.
* The constraint statement has a flat list of elements. The path element provides the overall structure and it must match the structure and names in the resource structure exactly.
* The condition element is used to assert that a constraint defined on another element affects the allowed cardinality of this element.
* The type is used to specify which types apply when the underlying resource allows a choice of types. When the type of the element is fixed in the underlying resource definitions, it should still be stated in the profile. The type is optional because repeating groups of elements do not have a type.
* The definition (short, formal, comments and the mappings) for an element is provided so that the resource profile can provide a more specific definition for the field in a specific context. For instance, the underlying resource definition might be "Result value" and the more specific resource definition could be "Plasma Cholesterol Test Value". The meaning needs to be consistent with the underlying definition, but narrower - a constraint on it.
* For an element with a maximum cardinality of 1, there can only be one entry in the value list, which is either a literal fixed type (with an element name matching the type of the fixed value) or a name, which is a reference to a named constraint pattern. If the element has a maximum cardinality of >1, then there can be multiple values - again, either fixed values with a type or a named constraint. Each of these appears in the list with the order and cardinality specified. By this means, a list may be "sliced" into a series of different components.
* There can be more than one entry for each element path. The constraint specification can define multiple different constraints for any element and then use them in different places. In practice, this is useful when slicing a list and the differently named constraint profiles are invoked using the *values* element. The name of the element constraint must be unique within the constraint specification for that resource. If a constraint does not have a name, it applies to the base resource and must be found in the correct place in the structure.
* Closed is only relevant if the underlying element has a max cardinality > 1.
* For an extension definition, the cardinality constraints are limits on the constraints of any reference to the extension in a profile. For example, if the minimum cardinality of an extension is 1 when it is defined, then any profile that includes that extension in the instance must include it with a minimum cardinality of 1 and therefore any instance that conforms to the profile must include the extension. Note, however, that if the extension is simply directly referenced in an instance rather than applied through a profile, the minimum cardinality doesn't apply, though the maximum one still does.
* For xpath constraints, the prefix "f" should be used for "http://hl7.org/fhir", and "h" for "http://www.w3.org/1999/xhtml". XPath constraints are written against the XML representation, but must be true in any other representation as well
* When using xpath to make constraints about the relationship between the contents of the narrative and the contents of the data elements, the element against which the rule is expressed is the one against which the error will be reported.

### 3.38.7: Profiled FHIR

If a profile is unambiguous, then the FHIR profile tooling (ref to be provided when the tooling exists) is able to generate reference implementation based object models that express the profiled model natively, where the object interface does not include prohibited elements, treats declared extensions as primary properties and slices lists according to the profile. This eases the burden on an implementer, though this object model can only be used with a sub-set of the possible resources.

The tooling is also able to generate bi-directional transforms between the [normal XML format](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats) and an XML representation of this profiled object model and schema for this profiled XML representation. This XML form has extensions promoted into the primary XML form by using the extension code as the XML name and sliced lists are renamed to use the Profile.resource.element.name as the XML element name. Profiles are only suitable for this use if they ensure that there are no clashing extension names when the extension definition spaces are ignored and that the sliced list names are appropriate.

Implementations are allowed to exchange this profiled XML format. Implementations that do so are not fully conformant to FHIR; instead they can claim to be conformant to "Profiled FHIR". Implementations should consider carefully before adopting this approach; while it will reduce the amount of work required to initially implement particular profiles, it will increase the amount of work required to exchange this data with other communities or to re-use tooling and applications that are also used in other contexts. This cost should particularly be considered in light of the fact that the previously discussed tooling allows applications to be written as though they are dealing with "Profiled FHIR" instances when they are in fact sending and receiving fully conformant FHIR instances.

### 3.38.8: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| author : string | Name or id of the author of the profile |  |
| binding : token | A vocabulary binding code |  |
| code : token | A code for the profile in the format uri::code (server may choose to do subsumption) |  |
| date : date | The profile publication date |  |
| extension : token | An extension code (use or definition) |  |
| name : string | A portion of the name of the profile |  |
| reference : token | An id of another profile referenced in the profile |  |
| resource : token | A resource constrained in a profile |  |
| status : token | The current status of the profile |  |
| type : token | Type of resource that is constrained in the profile |  |
| word : text | A word somewhere in the definition of the profile or the elements in the resource. (Common words - 'and', etc. - are often not supported) |  |

## 3.39: Resource Definition: Provenance

Provenance information associated with another resource that can be used to help determine its reliability or trace where the information in it came from. The focus of the provenance resource is record keeping, audit and traceability, not clinical meaning.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /provenance/

The provenance resource tracks information about the entities, activities, and people involved in producing a resource. This information can be used to form assessments about its quality, reliability or trustworthiness, or to provide pointers for where to go to further investigate the origins of the resource and the information in it.

[Provenance resources (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) are a record-keeping assertion that gathers information about the context in which the information in a resource was obtained. Provenance resources are prepared by the application that initiates the create/update etc. of the resource. A [Security Event (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) resource contains overlapping information, but is created as events occur, to track and audit the events. Security Event resources are often (though not exclusively) created by the application responding to the read/query/create/update etc. event.

### 3.39.1: Resource Content

See also the [Examples (§4.44)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenanceEx) and the [Definitions (§5.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenanceDefn).

<[**Provenance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance) xmlns="http://hl7.org/fhir">

<[**target**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.target)><!-- **1..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Target resource(s) (usually version specific) --></target>

<[**activity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.activity)> <!-- **1..1** Activity that created resource -->

<[**period**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.activity.period)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) When the activity occurred --></period>

<[**recorded**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.activity.recorded) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **1..1** When the activity was recorded / updated -->

<[**reason**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.activity.reason)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Reason the activity is occurring --></reason>

<[**location**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.activity.location)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Where the activity occurred, if relevant --></location>

<[**policy**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.activity.policy) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** Policy or plan the activity was defined by -->

</activity>

<[**party**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.party)> <!-- **0..\*** Person, organization, records, etc. involved in creating resource -->

<[**role**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.party.role)><!-- **1..1** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) [author | overseer | enterer | attester | source | cc: +](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-role) --></role>

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.party.type)><!-- **1..1** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) [Resource | Person | Application | Record | Document +](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-type) --></type>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.party.identifier) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **1..1** Identity of participant (urn or url) -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.party.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Human description of participant -->

</party>

<[**signature**](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-definitions.Provenance.signature) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Base64 Cryptographic signature of resource (DigSig) -->

</Provenance>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/provenance.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/provenance.profile.xml)

#### 3.39.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Provenance.party.role | The role that a provenance participant played | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/provenance-participant-role](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-role) |
| Provenance.party.type | The type of a provenance participant | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/provenance-participant-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-type) |

#### 3.39.1.2: Using the Provenance Resource

The provenance resource identifies information about another resource (the *reference* element). The provenance resource may be used in several different ways:

* As part of a [document bundle (§2.4.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document.bundle) where it identifies the provenance of part or all of the document
* On a [RESTful system](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) where it keeps track of provenance information relating to resources

When used in a document bundle, the *references* are often not explicitly versioned, but they always implicitly pertain to the version of the resource found in the document. On a RESTful system, the target resource reference should be version specific, but this requires special care: For new resources that need to have a corresponding Provenance resource, the version-specific reference is often not knowable until after the target resource has been updated. This can create an integrity problem for the system - what if the provenance resource cannot be created after the target resource has been updated? To avoid any such integrity problems, the target resource and the provenance resources should be submitted as a pair using a [transaction (§2.1.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#http.transaction).

#### 3.39.1.3: Digital Signatures

The provenance resource includes a signature element which contains an [XML digital signature (http://www.w3.org/TR/xmldsig-core/)](http://www.w3.org/TR/xmldsig-core/) . If present, the signature is always a signature of the target resource XML representation. The digital signature is always included as a plain string with appropriate escaping for both XML and JSON.

Note that servers that modify the resource on submission will break the digital signature.

Todo: how can you sign tags as well as the resource?

#### 3.39.1.4: Party References

Because the Provenance resource often refers to parties that are not represented as FHIR resources, the *party* doesn't have a simple reference to other resources. Instead, if the party refers to a FHIR resource, the party is represented like this:

<party>

<type>

<system>http://hl7.org/fhir/resource-types</system>

<code>Person</code>

</type>

<id>http://acme.org/fhir/person/@34/history/@3</id>

</x>

This is the same pattern as a standard resource reference, but the type becomes extensible to allow referencing other kinds of resources. This form of reference is a reference to the real world concept represented by the resource. If, on the other hand, the reference was to the resource itself (i.e. as the source of information on another resource), then the reference would be represented like this:

<party>

<type>

<system>http://hl7.org/fhir/provenance-participant-type</system>

<code>resource</code>

</type>

<id>http://acme.org/fhir/person/@34/history/@3</id>

</x>

#### 3.39.1.5: W3C Provenance Mappings

The provenance resource is based on known practices in the HL7 implementation space, particularly those found in the v2 EVN segment, the v3 ControlAct Wrapper, the CDA header, and the IHE ATNA ([RFC 3881 (http://www.rfc3881.net)](http://www.rfc3881.net/) ). The conceptual model underlying the design is the [W3C Provenance Specification (http://www.w3.org/2011/prov/wiki/Main\_Page)](http://www.w3.org/2011/prov/wiki/Main_Page) . Though the content and format of the resource is designed to meet specific requirements for FHIR, all the parts of the resource are formally mapped to the PROV-O specification, and FHIR resources can be transformed to their W3C PROV equivalent.

Formal W3C Provenance Mappings - to do

### 3.39.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| end : date | The end of the period, if not ongoing | Provenance.activity.period.end |
| location : reference | Where the activity occurred, if relevant | Provenance.activity.location |
| party : token | Identity of participant (urn or url) | Provenance.party.identifier |
| partytype : token | Resource | Person | Application | Record | Document + | Provenance.party.type |
| start : date | The start of the period | Provenance.activity.period.start |
| target : reference | Target resource(s) (usually version specific) | Provenance.target |

## 3.40: Resource Definition: Questionnaire

A set of answers to predefined lists of questions. The questions may be ordered and grouped into coherent subsets, corresponding to the structure of the grouping of the underlying questions..

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /questionnaire/

A Questionnaire is a structured set of questions and their answers. The Questionnaire may be a flat list, or can be hierarchically organized in groups and sub-groups, each containing questions. Questions may contain and single answer, which can take the form of simple text, numbers, dates or a set of coded choices.

Questionnaires cover the need to communicate data originating from forms used in medical history examinations, research questionnaires and sometimes full clinical speciality records. In many systems this data is collected using user-defined screens and forms. Questionnaires record specifics about data capture - exactly what questions were asked, in what order, what choices for answers were, etc. Each of these questions are part of the Questionnaire, and as such the Questionnaire is a separately identifiable Resource, whereas the individual questions are not.

Groups and questions that make up a Questionnaire can be explicitly named to refer to externally defined numbering or identification of questions and sections on formally defined questionnaires. This allows extraction of the data on a form and post-processing of the data contained in a Questionnaire. Such naming is not required however and Questionnaires may be quite loosely defined. The section [Questionnaire versus Resources (§3.40.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire.qversusr) below discusses the issues of collecting data in such loosely defined Questionnaires versus collecting data as well-defined separate Resources.

Questionnaires differ from Lists because Lists regroup or summarize existing information, while Questionnaires contain original, clinician collected data. Questionnaires are similar to Documents. However, the purpose of a Questionnaire is the capture of raw data as opposed to the composition and assertion of information intended for long term persistence and use in a Document.

Examples of Questionnaires are:

* Past medical history (PMH)
* Family diseases
* Social history
* Research questionnaires
* Quality and evaluation forms

Support for validation is outside the scope of this Resource, although basic structural features can be defined using the [Questionnaire core extensions (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-extensions-spreadsheet).

### 3.40.1: Resource Content

See also the [Examples (§4.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaireEx) and the [Definitions (§5.48)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaireDefn).

<[**Questionnaire**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire) xmlns="http://hl7.org/fhir">

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [registered|interim|final|amended|cancelled|withdrawn §](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) -->

<[**authored**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.authored) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** Date this version was authored § -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[RelatedPerson](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson.RelatedPerson)) The subject of the questionnaires § --></subject>

<[**author**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.author)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[RelatedPerson](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson.RelatedPerson)) Person that collected the answers § --></author>

<[**source**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.source)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[RelatedPerson](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson.RelatedPerson)) The person that answered the questions § --></source>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.name)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Name/code for a predefined list of questions §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-name) --></name>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identification of this questionnaire § --></identifier>

<[**encounter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.encounter)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.Encounter)) Primary encounter during which the answers were collected § --></encounter>

<[**question**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.question)> <!-- **0..\*** Answers to questions -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.question.name)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Code or name of the question](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-question-name) --></name>

<[**text**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.question.text) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Text of the question -->

<[**answer[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.question.answer_x_)><!-- **0..1** [decimal](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.decimal)|[integer](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.integer)|[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)|

[date](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.date)|[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)|[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)|[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant) Single-valued answer to the question --></answer[x]>

<[**choice**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.question.choice)><!-- **0..\*** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) Selected options --></choice>

<[**options[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.question.options_x_)><!-- **0..1** [uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)|[Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([ValueSet](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset.ValueSet)) Valueset containing the possible options --></options[x]>

<[**data[x]**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.question.data_x_)><!-- **0..1** Structured answer --></data[x]>

<[**remarks**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.question.remarks) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Remarks about the answer given -->

</question>

<[**group**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.group)> <!-- **0..\*** Grouped answers -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.group.name)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Code or name of the section on a questionnaire](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-group-name) --></name>

<[**header**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.group.header) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Header for the group -->

<[**text**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.group.text) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Additional text for the group -->

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.group.subject)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) The subject this group's answers are about --></subject>

<[**question**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.group.question)><!-- **0..\*** Content as for Questionnaire.question Questions belonging to this group --></question>

<[**group**](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-definitions.Questionnaire.group.group)><!-- **0..\*** Content as for Questionnaire.group Nested questionnaire group --></group>

</group>

</Questionnaire>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/questionnaire.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/questionnaire.profile.xml)

#### 3.40.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Questionnaire.status | Codes providing the status of an observation | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/observation-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) |
| Questionnaire.name | Structured names for forms | Example | [http://hl7.org/fhir/vs/questionnaire-name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-name) |
| Questionnaire.question.name | Structured names for questions on the form | Example | [http://hl7.org/fhir/vs/questionnaire-question-name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-question-name) |
| Questionnaire.group.name | Structured names for (sub)sections of forms | Example | [http://hl7.org/fhir/vs/questionnaire-group-name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-group-name) |

#### 3.40.1.2: Constraints

* On Questionnaire.question: Must supply either a simple answer, a choice, data or nothing (xpath on f:Questionnaire/f:question: count(f:data) + count(f:choice) + count(f:value) <= 1)

### 3.40.2: Notes:

* The information on questionnaires can be collected during several interactions with the patient, and therefore amended and changed over time. The Questionnaire.status attribute is used to support this lifecycle.
* Questionnaires can be authored by clinicians, the patient his/herself or a patients relatives (or even owner in the case of animals). Clinicians may author questionnaires, where the answers are provided by others on behalf of the patient his/herself. Additionally, information gathered for the purpose of a patient may be about the patient's relatives (e.g. in family anamnesis). Therefore, Questionnaire makes a distinction between the author, the subject and the source of information.
* Questionnaires often correspond to predefined forms, which may be recorded using Questionnaire.name. Questionnaires.identifier identify a specific set of answers to the questions on these forms.
* Questionnaires may directly contain Questions and/or contain Groups and subgroups with Questions. These may or may not correspond to the structure of the original form. If they do correspond, Groups may be named, so answers on a Questionnaire can refer to a corresponding sections of a form. Likewise, answers to Questionnaires can be named to refer to the question on a form. It is also possible to include textual content on the form in Questionnaire (see below).
* Since sections and questions may be answered multiple times, the same Group.name and Question.name may appear multiple times.
* Questionnaire allows for flexible naming and structuring of its contents to reflect the flexible and varying nature of forms and questionnaires. It explicitly does not try to standardize or streamline exchange of its contents outside its context of use, although exchanging partners may further constrain its structure and flexibility using profiles to define standardized, reusable forms.
* Because of the lack of explicit support for Questionnaires in HL7v3, HL7 CDA Documents frequently used named sections with Observations to model Questionnaires. Such use cases should now utilize the Questionnaire Resource instead.
* The Questionnaire's *encounter* element can be used to link to the encounter during which the Questionnaire was taken. This can be relevant since the encounter gives context to the answers and can be used to relate information in the Questionnaire to orders and observations that were done during the same Encounter.

### 3.40.3: Using Questionnaires versus using Resources

There is considerable overlap between the information covered by Questionnaires and other Resources (especially FamilyHistory, MedicationStatement, Observation, Procedure, etc.): Questionnaire's flexible structure can easily be misused to capture any data, even data that should be captured as separate Resources. The choice between using Questionnaires or separate Resources may be dictated by the procedure of collection and recording. E.g. if the data is captured as a physician-agreed (electronic) form, it might be impossible or undesirable to distill separate resources from it, and the Questionnaire must be stored and communicated as a whole.

However, data captured only in Questionnaires can be difficult to query after-the-fact: queries against other Resources will not return data captured only in Questionnaires, and querying against Questionnaires directly may not find all desired data, depending on how the questions may have been phrased or encoded over time or by different clinicians. Moreover, interoperability of such Questionnaires is limited as interpretation of its contents is only known to the circle of parties that were involved in its definition: encoding data from such Questionnaires using other, more specific, Resources increases the ability and consistency with which it can be understood and queried.

To facilitate better standardization of the information on a form, Questionnaire has the capacity (Using a Question's *data* element) to allow systems to communicate (part of) the answers in the form of structured FHIR data. This provides an upgrade path to the questionnaire designer and communicating systems, where capable systems may use FHIR data to answer (sets of) questions, whereas other systems can simply continue to supply the direct answers as input by the user.

### 3.40.4: Providing Questions and Answers

The Questionnaire has been specifically designed to be able to contain both a form's questions and answers. The Group and Question construct has elements to carry textual data of the form like headings, explanatory text, actual question text and the text of (multiple)choice options. As such, the Questionnaire can be used to:

* only contain answers (in which case the actual layout and questions of the form is defined in some external way, and the *name* elements are used to relate the answers to the questions)
* contain a combination of questions and answers (e.g. when it is deemed important to keep the actual question text with the answer) or
* only contain the Questions, which is equivalent to an "empty form".

This third case can be useful to make Questionnaire serve as a kind of form "definition", where FHIR clients receive the empty form, display it to the user, get answers from the users and then return the combined questions and answers to the server. The [questionnaire core extensions (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-extensions-spreadsheet) provide additional means for control over repeating sections and expected answer format.

### 3.40.5: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| author : reference | the author of the questionnaire | Questionnaire.author |
| authored : date | when the questionnaire was authored | Questionnaire.authored |
| encounter : reference | encounter during which questionnaire was authored | Questionnaire.encounter |
| identifier : token | an identifier for the questionnaire | Questionnaire.identifier |
| name : token | name of the questionnaire | Questionnaire.name |
| status : token | The status of the questionnaire | Questionnaire.status |
| subject : reference | the subject of the questionnaire | Questionnaire.subject |

## 3.41: Resource Definition: RelatedPerson

Information about a person that is involved in the care for a patient, but who is not the target of healthcare, nor has a formal responsibility in the care process.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /relatedperson/

RelatedPersons typically have a personal or non-healthcare-specific professional relationship to the patient. A RelatedPerson resource is primarily used for attribution of information, since RelatedPersons are often a source of information about the patient. For keeping information about persons for contact purposes for a patient, use a Patient's Contact element instead. Example RelatedPersons are:

* A patient's wife or husband
* A patient's relatives or friends
* A neighbour bringing a patient to the hospital
* The owner or trainer of a horse
* A patient's attorney or guardian

### 3.41.1: Resource Content

See also the [Examples (§4.47)](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedpersonEx) and the [Definitions (§5.49)](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedpersonDefn).

<[**RelatedPerson**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson.identifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) A Human identifier for this person § --></identifier>

<[**patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson.patient)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) The patient this person is related to § --></patient>

<[**relationship**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson.relationship)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [The nature of the relationship §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-relatedperson-relationshiptype) --></relationship>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson.name)><!-- **0..1** [HumanName](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.HumanName) A name associated with the person § --></name>

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) A contact detail for the person § --></telecom>

<[**gender**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson.gender)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Gender for administrative purposes §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) --></gender>

<[**address**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson.address)><!-- **0..1** [Address](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address) Address where the related person can be contacted or visited § --></address>

<[**photo**](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson-definitions.RelatedPerson.photo)><!-- **0..\*** [Attachment](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Attachment) Image of the person --></photo>

</RelatedPerson>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/relatedperson.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/relatedperson.profile.xml)

#### 3.41.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| RelatedPerson.relationship | The nature of the relationship between a patient and the related person | Example | [http://hl7.org/fhir/vs/relatedperson-relationshiptype (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-relatedperson-relationshiptype) |
| RelatedPerson.gender | The gender of a person used for administrative purposes | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/administrative-gender (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) |

### 3.41.2: Notes:

### 3.41.3: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| address : string | an address in any kind of address/part | RelatedPerson.address |
| gender : token | gender of the person | RelatedPerson.gender |
| identifier : token | A patient Identifier | RelatedPerson.identifier |
| name : string | a portion of name in any name part | RelatedPerson.name |
| patient : reference | The patient this person is related to | RelatedPerson.patient |
| phonetic : string | a portion of name using some kind of phonetic matching algorithm |  |
| telecom : string | the value in any kind of contact | RelatedPerson.telecom |

## 3.42: Resource Definition: SecurityEvent

A record of an event made for purposes of maintaining a security log. Typical uses include detection of intrusion attempts and monitoring for inappropriate usage.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /securityevent/

The security even is based on the ATNA Audit record definitions, originally from [RFC 3881 (http://www.rfc3881.net)](http://www.rfc3881.net/) , and now managed by DICOM (see [DICOM Part 15 Annex A5 (http://medical.nema.org/Dicom/2011/11\_15pu.pdf)](http://medical.nema.org/Dicom/2011/11_15pu.pdf) ). This resource is managed collaboratively between HL7, DICOM, and IHE for the MHD/mHealth initiatives.

Servers that provide support for Security Event resources should not generally accept update or delete operations on the resources, as this would compromise the integrity of the audit record.

Security Events are created as events occur, to track and audit the events. Security Event resources are often (though not exclusively) created by the application responding to the read/query/create/update etc. event. A [Provenance resource (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) contains overlapping information, but is a record-keeping assertion that gathers information about the context in which the information in a resource was obtained. Provenance resources are prepared by the application that initiates the create/update etc. of the resource.

### 3.42.1: Resource Content

See also the [Examples (§4.48)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityeventEx) and the [Definitions (§5.50)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityeventDefn).

<[**SecurityEvent**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent) xmlns="http://hl7.org/fhir">

<[**event**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.event)> <!-- **1..1** What was done -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.event.type)><!-- **1..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Type of event](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-type) --></type>

<[**subtype**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.event.subtype)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Sub-type of event](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sub-type) --></subtype>

<[**action**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.event.action) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Type of action performed during the event](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) -->

<[**dateTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.event.dateTime) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **1..1** Time when the event occurred on source -->

<[**outcome**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.event.outcome) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Whether the event succeeded or failed](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-outcome) -->

<[**outcomeDesc**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.event.outcomeDesc) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Description of the event outcome -->

</event>

<[**participant**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant)> <!-- **1..\*** A person, a hardware device or software process -->

<[**role**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.role)><!-- **0..\*** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [User roles (e.g. local RBAC codes)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicm-402-roleid) --></role>

<[**reference**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.reference)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)|[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Direct reference to resource --></reference>

<[**userId**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.userId) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Unique identifier for the user -->

<[**authId**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.authId) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** User id used by authentication system -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Human-meaningful name for the user -->

<[**requestor**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.requestor) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **1..1** Whether user is initiator -->

<[**media**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.media)><!-- **0..1** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) Type of media --></media>

<[**network**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.network)> <!-- **0..1** Logical network location for application activity -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.network.identifier) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Identifier for the network access point of the user device -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.participant.network.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [The type of network access point](http://hl7.org/implement/standards/fhir/fhir-book.htm#network-type) -->

</network>

</participant>

<[**source**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.source)> <!-- **1..1** Application systems and processes -->

<[**site**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.source.site) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Logical source location within the enterprise -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.source.identifier) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** The id of source where event originated -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.source.type)><!-- **0..\*** [Coding](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) [The type of source where event originated](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-source-type) --></type>

</source>

<[**object**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object)> <!-- **0..\*** Specific instances of data or objects that have been accessed -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Specific instance of object (e.g. versioned) --></identifier>

<[**reference**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.reference)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Any](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources)) Specific instance of resource (e.g. versioned) --></reference>

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.type) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Object type being audited](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-type) -->

<[**role**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.role) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Functional application role of Object](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-role) -->

<[**lifecycle**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.lifecycle) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Life-cycle stage for the object](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-lifecycle) -->

<[**sensitivity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.sensitivity)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Policy-defined sensitivity for the object](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sensitivity) --></sensitivity>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Instance-specific descriptor for Object -->

<[**query**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.query) value="[[base64Binary](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.base64Binary)]"/><!-- **0..1** Actual query for object -->

<[**details**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.details)> <!-- **0..\*** Additional Information about the Object -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.details.type) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Name of the property -->

<[**value**](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-definitions.SecurityEvent.object.details.value) value="[[base64Binary](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.base64Binary)]"/><!-- **1..1** Property value -->

</details>

</object>

</SecurityEvent>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/securityevent.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/securityevent.profile.xml)

#### 3.42.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| SecurityEvent.event.type | Type of event | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/security-event-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-type) |
| SecurityEvent.event.subtype | Sub-type of event | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/security-event-sub-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sub-type) |
| SecurityEvent.event.action | Indicator for type of action performed during the event that generated the audit. | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/security-event-action](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) |
| SecurityEvent.event.outcome | Indicates whether the event succeeded or failed | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/security-event-outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-outcome) |
| SecurityEvent.participant.role | Role(s) the user plays (from RBAC) | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/dicm-402-roleid (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicm-402-roleid) |
| SecurityEvent.participant.network.type | the type of network access point that originated the audit event | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/network-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#network-type) |
| SecurityEvent.source.type | Code specifying the type of source where event originated | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/security-source-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-source-type) |
| SecurityEvent.object.type | Code for the participant object type being audited | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/object-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-type) |
| SecurityEvent.object.role | Code representing the functional application role of Participant Object being audited | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/object-role](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-role) |
| SecurityEvent.object.lifecycle | Identifier for the data life-cycle stage for the participant object | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/object-lifecycle](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-lifecycle) |
| SecurityEvent.object.sensitivity | The sensitivity of an object in a security event resource. May also encompass confidentiality and rudimentary access control | Example | [http://hl7.org/fhir/vs/security-event-sensitivity (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sensitivity) |

#### 3.42.1.2: Constraints

* On SecurityEvent.participant: Either an userId or a reference (xpath on f:SecurityEvent/f:participant: exists(f:userId) != exists(f:reference))
* On SecurityEvent.object: Either an identifier or a reference (xpath on f:SecurityEvent/f:object: exists(f:identifier) != exists(f:reference))
* On SecurityEvent.object: Either a name or a query (xpath on f:SecurityEvent/f:object: not(exists(f:name)) or not(exists(f:query)))

#### 3.42.1.3: Using Coded Values

The security event resource and the ATNA Audit record are used in many contexts through healthcare. The coded values defined in the "extensible" bindings above are those widely used and/or defined by DICOM, IHE or ISO, who all defined these codes to meet very specific use cases. These codes should be used when they are suitable, or other codes can be defined.

The set of codes defined for this resource are expected to grow over time, and additional codes may be proposed / requested using the community input link above.

#### 3.42.1.4: Event codes for Common Scenarios

This table summarises common event scenarios, and the codes that should be used for each case.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scenario** | **type** | **subtype** | **action** | **Other** |
| User Login ([example (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-examples)) | [110114 (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim.110114) User Authentication | [110122 (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim.110122) User Authentication | [E](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) Execute | One participant which contains the details of the logged in user |
| OAuth based User Login | [110114 (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim.110114) User Authentication | [110122 (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim.110122) User Authentication | [E](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) Execute | todo |
| User Logout ([example (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-examples)) | [110114 (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim.110114) User Authentication | [110123 (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim.110123) User Logout | [E](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) Execute | One participant which contains the details of the logged out user |
| REST operation logged on server ([example (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent-examples)) | [rest (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-type) RESTful Operation | [[code]](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-operation) defined for operation | [\*](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) (see below) | Participant for logged in user, if available, and one object with a reference if at least the type is known as part of the operation. Reference.url should be provided to the granularity known |

Security Event Actions for RESTful operations:

|  |  |
| --- | --- |
| **Operation** | **Action** |
| create | C |
| read, vread, tags-get, history-instance, history-type, history-system | R |
| update, tags-update | U |
| delete, tags-delete | D |
| search, validate, transaction, conformance, mailbox | E |

### 3.42.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| action : token | Type of action performed during the event | SecurityEvent.event.action |
| address : token | Identifier for the network access point of the user device | SecurityEvent.participant.network.identifier |
| authid : token | User id used by authentication system | SecurityEvent.participant.authId |
| date : date | Time when the event occurred on source | SecurityEvent.event.dateTime |
| desc : string | Instance-specific descriptor for Object | SecurityEvent.object.name |
| id : token | Specific instance of object (e.g. versioned) | SecurityEvent.object.identifier |
| name : string | Human-meaningful name for the user | SecurityEvent.participant.name |
| object-type : token | Object type being audited | SecurityEvent.object.type |
| patientid : token | The id of the patient (one of multiple kinds of participations) |  |
| reference : reference | Specific instance of resource (e.g. versioned) | SecurityEvent.object.reference |
| site : token | Logical source location within the enterprise | SecurityEvent.source.site |
| source : token | The id of source where event originated | SecurityEvent.source.identifier |
| subtype : token | Sub-type of event | SecurityEvent.event.subtype |
| type : token | Type of event | SecurityEvent.event.type |
| user : token | Unique identifier for the user | SecurityEvent.participant.userId |

## 3.43: Resource Definition: Specimen

Sample for analysis.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /specimen/

Placeholder

### 3.43.1: Resource Content

See also the [Examples (§4.49)](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimenEx) and the [Definitions (§5.51)](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimenDefn).

<[**Specimen**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) External Identifier --></identifier>

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.type)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Type of specimen](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-type) --></type>

<[**source**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.source)> <!-- **0..\*** Parent of specimen -->

<[**relationship**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.source.relationship) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [parent | child](http://hl7.org/implement/standards/fhir/fhir-book.htm#hierarchical-relationship-type) -->

<[**target**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.source.target)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Specimen](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen.Specimen)) The subject of the relationship --></target>

</source>

<[**subject**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.subject)><!-- **1..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)|[Group](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.Group)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)|[Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)) The subject of the report --></subject>

<[**accessionIdentifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.accessionIdentifier)><!-- **0..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Accession Identifier --></accessionIdentifier>

<[**receivedTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.receivedTime) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Received Time -->

<[**collection**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.collection)> <!-- **1..1** Collection details -->

<[**collector**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.collection.collector)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who collected the specimen --></collector>

<[**comments**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.collection.comments) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..\*** Collector comments -->

<[**collectedTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.collection.collectedTime) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **1..1** Collection time -->

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.collection.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) The quantity of specimen collected --></quantity>

<[**method**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.collection.method)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Specimen Collection Method](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-collection-type) --></method>

<[**sourceSite**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.collection.sourceSite)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Site of the source of the specimen](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) --></sourceSite>

</collection>

<[**treatment**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.treatment)> <!-- **0..\*** Specimen Treatments -->

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.treatment.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Textual description of procedure -->

<[**procedure**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.treatment.procedure)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Specimen Treatment Procedure](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-treatment-procedure) --></procedure>

<[**additive**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.treatment.additive)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)) Specimen additive --></additive>

</treatment>

<[**container**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.container)> <!-- **0..\*** Specimen Container -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.container.identifier)><!-- **1..\*** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Id for container --></identifier>

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.container.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Textual description of container -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.container.type)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Specimen Container Type](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-container-type) --></type>

<[**capacity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.container.capacity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Container Capacity --></capacity>

<[**specimenQuantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.container.specimenQuantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Specimen Container Quantity --></specimenQuantity>

<[**additive**](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen-definitions.Specimen.container.additive)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)) Container Additive --></additive>

</container>

</Specimen>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/specimen.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/specimen.profile.xml)

#### 3.43.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Specimen.type | The type of the specimen. This is sometimes called the "matrix" | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/specimen-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-type) |
| Specimen.source.relationship | Type indicating if this is a parent or child relationship | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/hierarchical-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#hierarchical-relationship-type) |
| Specimen.collection.method | The technique that is used to perform the procedure | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/specimen-collection-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-collection-type) |
| Specimen.collection.sourceSite | Codes describing anatomical locations. May include laterality | Example | [http://hl7.org/fhir/vs/body-site (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) |
| Specimen.treatment.procedure | Type indicating the technique used to process the specimen | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/specimen-treatment-procedure (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-treatment-procedure) |
| Specimen.container.type | Type of specimen container | Example | [http://hl7.org/fhir/vs/specimen-container-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-container-type) |

### 3.43.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| subject : reference | the subject of the specimen | Specimen.subject |

## 3.44: Resource Definition: Substance

Substance.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /substance/

This resource has had some sample content created for it so that other resources can refer to it.

### 3.44.1: Resource Content

See also the [Examples (§4.50)](http://hl7.org/implement/standards/fhir/fhir-book.htm#substanceEx) and the [Definitions (§5.52)](http://hl7.org/implement/standards/fhir/fhir-book.htm#substanceDefn).

<[**Substance**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Identifier of the substance --></identifier>

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Name of the substance -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.type)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Type of the substance --></type>

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Description of the substance -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.status)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Substance status --></status>

<[**effectiveTime**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.effectiveTime)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Substance effective period --></effectiveTime>

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Substance amount --></quantity>

<[**ingredient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.ingredient)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)) Substance composition --></ingredient>

<[**quantityMode**](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-definitions.Substance.quantityMode)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) Absolute | Relative --></quantityMode>

</Substance>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/substance.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/substance.profile.xml)

#### 3.44.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Substance.type | Type of the substance | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| Substance.status | Substance status | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |
| Substance.quantityMode | Mode of the quantity element | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | ?? |

### 3.44.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| name : token | The name of the substance | Substance.name |
| type : token | The type of the substance | Substance.type |

## 3.45: Resource Definition: Supply

A supply - request and provision.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /supply/

The scope of the supply resource is for supplies used in the healthcare process. This includes supplies specifically used in the treatment of patients as well as supply movement within an institution (transport a set of supplies from materials management to a service unit (nurse station). This resource does not include the provisioning of transportation services.

### 3.45.1: Resource Content

See also the [Examples (§4.51)](http://hl7.org/implement/standards/fhir/fhir-book.htm#supplyEx) and the [Definitions (§5.53)](http://hl7.org/implement/standards/fhir/fhir-book.htm#supplyDefn).

<[**Supply**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply) xmlns="http://hl7.org/fhir">

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.name)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [The kind of supply (central, non-stock, etc.)](http://hl7.org/implement/standards/fhir/fhir-book.htm" \l "valueset-supply-type) --></name>

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) Unique identifier --></identifier>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Dispensed|Received|Requested](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-status) -->

<[**orderedItem**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.orderedItem)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)|[Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Medication, Substance, or Device requested to be supplied --></orderedItem>

<[**patient**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.patient)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient.Patient)) Patient --></patient>

<[**dispense**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense)> <!-- **0..\*** Supply details -->

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.identifier)><!-- **0..1** [Identifier](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier) External identifier --></identifier>

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** [Active/Completed/Aborted](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-status) -->

<[**type**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.type)><!-- **0..1** [CodeableConcept](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.CodeableConcept) [Type of dispense](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-item) --></type>

<[**quantity**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.quantity)><!-- **0..1** [Quantity](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity) Amount dispensed --></quantity>

<[**suppliedItem**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.suppliedItem)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.Medication)|[Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance.Substance)|[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device.Device)) Medication, Substance, or Device being supplied --></suppliedItem>

<[**supplier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.supplier)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Dispenser --></supplier>

<[**whenPrepared**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.whenPrepared)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Dispensing time --></whenPrepared>

<[**whenHandedOver**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.whenHandedOver)><!-- **0..1** [Period](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Period) Handover time --></whenHandedOver>

<[**destination**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.destination)><!-- **0..1** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location.Location)) Where the Supply was sent --></destination>

<[**receiver**](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply-definitions.Supply.dispense.receiver)><!-- **0..\*** [Resource](http://hl7.org/implement/standards/fhir/fhir-book.htm#resources.Resource)([Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner.Practitioner)) Who collected the Supply --></receiver>

</dispense>

</Supply>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/supply.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/supply.profile.xml)

#### 3.45.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| Supply.name | Category of supply | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/supply-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-type) |
| Supply.status Supply.dispense.status | Status of the supply | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/supply-status (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-status) |
| Supply.dispense.type | The actual item being supplied | [Incomplete (§1.5.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.codeable) | [http://hl7.org/fhir/vs/supply-item (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-item) |

### 3.45.2: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| dispenseid : token | External identifier | Supply.dispense.identifier |
| dispensestatus : token | Active/Completed/Aborted | Supply.dispense.status |
| identifier : token | Unique identifier | Supply.identifier |
| name : token | The kind of supply (central, non-stock, etc.) | Supply.name |
| patient : reference | Patient | Supply.patient |
| status : token | Dispensed|Received|Requested | Supply.status |
| supplier : reference | Dispenser | Supply.dispense.supplier |

## 3.46: Resource Definition: ValueSet

A value set specifies a set of codes drawn from one or more code systems.

The resource name as it appears in a [RESTful URL](http://hl7.org/implement/standards/fhir/fhir-book.htm#http) is /valueset/

Value sets may be constructed in one of two ways:

* A value set can *define* its own codes, and/or
* A value set can be *composed* of codes defined in other code systems, either by listing the codes or by providing a set of selection criteria

A value set can also be "expanded", where the value set is turned into a simple collection of enumerated codes. This operation is performed to produce a collection of codes that are ready to use for data entry or validation. An expanded value set may also contain the original definition as well.

Valuesets resources are based on the fundamental definitions found in the [HL7 v3 Core Principles (http://www.hl7.org/v3ballot/html/infrastructure/coreprinciples/v3modelcoreprinciples.html)](http://www.hl7.org/v3ballot/html/infrastructure/coreprinciples/v3modelcoreprinciples.html) document and the functionality described in the [OMG CTS 2 (http://www.omg.org/spec/CTS2/1.0/)](http://www.omg.org/spec/CTS2/1.0/) specification. Value set resources can be converted to CTS2 value set and code system resources.

### 3.46.1: Resource Content

See also the [Examples (§4.52)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valuesetEx) and the [Definitions (§5.54)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valuesetDefn).

<[**ValueSet**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet) xmlns="http://hl7.org/fhir">

<[**identifier**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.identifier) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Logical id to reference this value set § -->

<[**version**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.version) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Logical id for this version of the value set § -->

<[**name**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.name) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Informal name for this value set § -->

<[**publisher**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.publisher) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Name of the publisher (Organization or individual) § -->

<[**telecom**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.telecom)><!-- **0..\*** [Contact](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact) Contact information of the publisher § --></telecom>

<[**description**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.description) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **1..1** Human language description of the value set § -->

<[**status**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.status) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [draft | experimental | review | production | withdrawn | superseded §](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-status) -->

<[**experimental**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.experimental) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If for testing purposes, not real usage § -->

<[**date**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.date) value="[[dateTime](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.dateTime)]"/><!-- **0..1** Date for given status § -->

<[**define**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define)> <!-- **0..1** When value set defines its own codes -->

<[**system**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define.system) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **1..1** URI to identify the code system -->

<[**caseSensitive**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define.caseSensitive) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If code comparison is case sensitive -->

<[**concept**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define.concept)> <!-- **0..\*** Concepts in the code system -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define.concept.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** Code that identifies concept -->

<[**abstract**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define.concept.abstract) value="[[boolean](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.boolean)]"/><!-- **0..1** If this code is not for use as a real concept -->

<[**display**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define.concept.display) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Text to Display to the user -->

<[**definition**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define.concept.definition) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Formal Definition -->

<[**concept**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.define.concept.concept)><!-- **0..\*** Content as for ValueSet.define.concept Child Concepts (is-a / contains) --></concept>

</concept>

</define>

<[**compose**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose)> <!-- **0..1** When value set includes codes from elsewhere -->

<[**import**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.import) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..\*** Import the contents of another value set -->

<[**include**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.include)> <!-- **0..\*** Include one or more codes from a code system -->

<[**system**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.include.system) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **1..1** The system the codes come from -->

<[**version**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.include.version) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** Specific version of the code system referred to -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.include.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..\*** Code or concept -->

<[**filter**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.include.filter)> <!-- **0..\*** Select codes/concepts by their properties (including relationships) -->

<[**property**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.include.filter.property) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** A property defined by the code system -->

<[**op**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.include.filter.op) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** [= | is\_a | is\_not\_a | regex](http://hl7.org/implement/standards/fhir/fhir-book.htm#filter-operator) -->

<[**value**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.include.filter.value) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **1..1** Code from the system, or regex criteria -->

</filter>

</include>

<[**exclude**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.compose.exclude)><!-- **0..\*** Content as for ValueSet.compose.include Explicitly exclude codes --></exclude>

</compose>

<[**expansion**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.expansion)> <!-- **0..1** When value set is an expansion -->

<[**timestamp**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.expansion.timestamp) value="[[instant](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.instant)]"/><!-- **1..1** Time valueset expansion happened -->

<[**contains**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.expansion.contains)> <!-- **0..\*** Codes in the value set -->

<[**system**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.expansion.contains.system) value="[[uri](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.uri)]"/><!-- **0..1** System value for the code -->

<[**code**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.expansion.contains.code) value="[[code](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.code)]"/><!-- **0..1** Code - if blank, this is not a choosable code -->

<[**display**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.expansion.contains.display) value="[[string](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.string)]"/><!-- **0..1** User display for the concept -->

<[**contains**](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-definitions.ValueSet.expansion.contains.contains)><!-- **0..\*** Content as for ValueSet.expansion.contains Codes contained in this concept --></contains>

</contains>

</expansion>

</ValueSet>

Alternate definitions: [Schema](http://hl7.org/implement/standards/fhir/valueset.xsd), RDF (to do), XMI (to do), [Resource Profile](http://hl7.org/implement/standards/fhir/valueset.profile.xml)

#### 3.46.1.1: Terminology Bindings

|  |  |  |  |
| --- | --- | --- | --- |
| **Path** | **Definition** | **Type** | **Reference** |
| ValueSet.status | The lifecycle status of a Value Set | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/valueset-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-status) |
| ValueSet.compose.include.filter.op | The kind of operation to perform as part of a property based filter | [Fixed (§1.5.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies.code) | [http://hl7.org/fhir/filter-operator](http://hl7.org/implement/standards/fhir/fhir-book.htm#filter-operator) |

#### 3.46.1.2: Constraints

* A value set with only one import must also have an include and/or an exclude unless the value set defines its own codes (xpath: not(exists(f:compose)) or (count(f:compose/f:import)!=1 or exists(f:compose/f:include) or exists(f:compose/f:exclude) or exists(f:define)))
* A defined code system (if present) must have a different identifier to the value set itself (xpath: not(exists(f:define)) or (f:define/f:system/@value != f:identifier/@value))
* Value set must contain either a define, a compose, or an expansion element (xpath: exists(f:define) or exists(f:compose) or exists(f:expansion))
* On ValueSet.compose: A value set composition must have an include or an import (xpath on f:ValueSet/f:compose: exists(f:include) or exists(f:import))
* On ValueSet.expansion.contains: Must have a code or a display (xpath on f:ValueSet/f:expansion/f:contains: exists(f:code) or exists(f:display))

### 3.46.2: Identifier and Version

The *identifier* and *version* elements may be used to reference this value set in a design, a profile, a CDA template or V3 message (valueSet and valueSetVersion). These different contexts may make additional restrictions on the possible values of these elements. These elements are generally not needed when using value sets with FHIR implementations as they can make use of the innate identifier and versioning mechanism associated with the resource

### 3.46.3: Value Sets that define codes

A value set that defines codes automatically includes all the codes it defines. This kind of value set is useful for simple sets of codes that are highly specific and context-dependent. The value set and the code system are both given URI identifiers by which they may be identified from elsewhere (ValueSet.identifier and ValueSet.define.system). These identifiers must be different.

* *ValueSet.define.system* is the URI that identifies these codes when used in a *Coding*
* The usability of the codes is closely linked to the quality of the definitions. Although a definition is not required for each concept, a good definition SHOULD be provided
* If concepts contain other concepts, then the contained concepts are "subsumed" by the containing concept (there is an "is-a" relationship between the codes).
* An abstract concept must have contained concepts

### 3.46.4: Value Sets that include codes defined elsewhere

Value sets that include codes defined in some other code system are most useful when dealing with large general code systems such as Snomed-CT, LOINC, RxNorm or various IETF code sets including human language. The value set can be a simple list of included codes or it can be some kind of general selection criteria using the facilities provided by the code system.

* Within an include or exclude criterion, multiple filters and concept selections are intersected. All the conditions specified must be true.
* The value set always includes any codes it defines itself. A typical use for this is when including a set of codes from elsewhere, and adding a few additional codes to cover cases not catered for by the included codes
* An include statement includes any enumerated codes and any codes that meet the filter criteria
* If the system reference is not version specific and filters are present, then the contents of the value set are open and change over time as the underlying code systems are updated
* The content of the value set is constructed by unioning of all the import and include statements and then eliminating any of the 'excluded' codes.
* A value set needs to do something. It can't simply include an existing value set without also including additional content or excluding content
* Using the property filters is only possible where the underlying code system defines appropriate properties. Note that in some cases, the underlying code system defines the logical concepts but not the syntax for exercising them. In such cases, the literal definitions may be provided by a third party. See below for notes about its use against common code systems

### 3.46.5: Value Set Expansion

A value set can be "expanded", where the definition of the value set is used to create a simple collection of codes suitable for use for data entry or validation. This is most useful when a value set includes all the children of a code or a set of codes by filter.

The standard way to produce a value set expansion is to perform a [query (§2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query) on the value set with \_query=expand:

GET [service-url]/valueset/?\_query=expand&id=...

This is a request to produce a value set expansion for the value set with the provided id. The value set can be identified by other means, such as identifier and version. There is an additional parameter flat=true|false, which the client can use to specify whether a hierarchical value set expansion is acceptable or not.

The value set expansion returned by this query should be treated as a transient result that will change over time (whether it does or not depends on how the value set is specified), so applications should repeat the query each time the value set is used.

A resource that represents a value set expansion includes the same identification details as the definition of the value set, and MAY include the definition of the value set (*define* and *compose* elements). In addition it has an *expansion* element which contains the list of codes that constitute the value set expansion. If the expansion is hierarchical (codes contain other concepts), there is no implication about the logical relationship between them; this is guidance for helping human user navigate the choice of codes that may or may not relate to the logical definitions of the codes or concepts.

### 3.46.6: Search Parameters

Search Parameters for RESTful searches. The standard parameters also apply. See [Searching (§2.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.base) for more information.

|  |  |  |
| --- | --- | --- |
| \_id : token | The logical resource id associated with the resource (must be supported by all servers) |  |
| code : token | a code defined in the value set | ValueSet.define.concept.code |
| description : string | Human language description of the value set | ValueSet.description |
| identifier : token | the identifier of the value set | ValueSet.identifier |
| name : string | a portion of the name of the value set | ValueSet.name |
| reference : token | a code system included or excluded in the value set or an imported value set | ValueSet.compose.include.system |
| status : token | the status of the value set | ValueSet.status |
| system : token | the system for any codes defined by this value set | ValueSet.define.system |
| version : token | the version identifier of the value set | ValueSet.version |

# 4: Examples

### 4.1.1: Resource Format Examples

This page includes additional examples of the resource format, based on common usages and questions

Todo

### 4.2.1: Data Type Examples

This page includes additional examples of the data types, based on common usages and questions

#### 4.2.1.1: Primitive Types

#### 4.2.1.2: String Patterns

#### 4.2.1.3: Attachment

#### 4.2.1.4: Identifier

#### 4.2.1.5: Coding

#### 4.2.1.6: CodeableConcept

#### 4.2.1.7: Choice

#### 4.2.1.8: Quantity

#### 4.2.1.9: Range

#### 4.2.1.10: Ratio

#### 4.2.1.11: Period

#### 4.2.1.12: HumanName

A Simple example

<name>

<family value="Everyman" />

<given value="Adam" />

<given value="A." />

</name>

Composite names

<name>

<family value="Contrata" />

<given value="Mary Jane" />

</name>

These cases can be quite ambiguous - is "Mary Jane" one name, or two? Different systems, and data enterers may treat this differently, and the person themselves may not know. Parts are allowed to contain spaces, but systems should consider how to treat these cases. Composite names separated by "-" should be treated as a single name part.

A common pattern: a person is called by a name other than that expected from their official name (first given name in most cultures).

<name>

<use value="official" />

<family value="Chalmers" />

<given value="Peter" />

<given value="James" />

</name>

<name>

<use value="usual" />

<given value="Jim" />

</name>

This same pattern is often encountered with immigrants, who retains their real name for official use, but adopt a localized name for everyday use:

<name>

<use value="official" />

<given value="Piotr" />

<given value="Andre" />

<family value="Sczypinski" />

</name>

<name>

<use value="usual" />

<family value="Skipper" />

<given value="Jim" />

</name>

Karen van Hentenryck is of Dutch origin, and the "van" is a voorvoegsel.

<name>

<use value="official" />

<family value="van">

<extension>

<url value="http://hl7.org/fhir/profile/@iso-21090#qualifier" />

<valueCode value="VV" />

</extension>

</family>

<family value="Hentenryck" />

<given value="Karen" />

</name>

See [the Extensibility Example for more information (§4.3.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility-examples)

Complex example from Germany: Dr.phil. Regina Johanna Maria Gräfin Hochheim-Weilenfels, NCFSA. This example shows extensive use of multiple given names, prefixes, suffixes, for academic degrees, nobility titles, and professional designations.

<name>

<use value="official" />

<family value="Hochheim-Weilenfels" />

<given value="Regina" />

<given value="Johanna" />

<given value="Maria" />

<prefix value="Gräfin">

<extension>

<url value="http://hl7.org/fhir/profile/@iso-21090#qualifier" />

<valueCoding>

<code value="NB" />

<system value="http://hl7.org/fhir/v3/EntityNamePartQualifier2" />

</valueCoding>

</extension>

</prefix>

<prefix value="Dr. phil.">

<extension>

<url value="http://hl7.org/fhir/profile/@iso-21090#qualifier" />

<valueCoding>

<code value="AC" />

<system value="http://hl7.org/fhir/v3/EntityNamePartQualifier2" />

</valueCoding>

</extension>

</prefix>

<suffix value="NCFSA" />

</name>

<name>

<use value="maiden" />

<family value="Hochheim" />

</name>

This example makes use of the ISO 21090 extensions to carry the rare ISO 21090 qualifier attributes "AC" and "NB".

Japanese example in the three forms: ideographic (Kanji), syllabic (Hiragana) and alphabetic (Romaji).

<name>

<family value="木村" />

<given value="通男" />

</name>

<name>

<family value="きむら" />

<given value="みちお" />

</name>

<name>

<family value="KIMURA" />

<given value="MICHIO" />

</name>

The three forms are differentiated by the character subset each contains.

Russian example in the two forms: cyrillic and latin:

<name>

<family value="ЕМЕЛИН" />

<given value="ИВАН" />

<given value="ВЛАДИМИРОВИЧ" />

</name>

<name>

<family value="EMELIN" />

<given value="IVAN" />

<given value="VLADIMIROV" />

</name>

In Russian usage, these names are known as the domestic and foreign names respectively. The two forms are differentiated by the character subset each contains.

Scandinavian example: Erikson is the family name. Jan Erik are the given names, and Östlund the family name of the mother, which is taken as a Mellannamn.

<name>

<use value="official" />

<family value="Erikson" />

<given value="Jan" />

<given value="Erik" />

<given value="Östlund">

<extension>

<url value="http://hl7.org/fhir/profile/@iso-20190#name-qualifier" />

<valueCoding>

<code value="MID" />

<system value="http://hl7.org/fhir/v3/EntityNamePartQualifier2" />

</valueCoding>

</extension>

</given>

</name>

This example makes use of the ISO 21090 extension to carry the culture specific ISO 21090 qualifier attribute "MID" for the Mellannamn.

Then Jan Erikson has a daughter, Karin, with his wife Margrete Hansen. The first communications of the new born name is "Margrete Jente" (Margrete's Girl) and the mother's family name, not the given name (Karin). The father's Family name is not used at all. This is a known temporary name assigned directly after the birth of the child.

<name>

<use value="temp" />

<!-- use could be OR+OLD, depends how record keeping is done -->

<family value="Hansen" />

<given value="Margrete Jente" />

</name>

The baby's name is subsequently changed to the fathers' family name, and to use the mother's name as mellomnamn.

<name>

<use value="official" />

<family value="Erikson" />

<given value="Karin" />

<given value="Hansen">

<extension>

<url value="http://hl7.org/fhir/profile/@iso-20190#name-qualifier" />

<valueCoding>

<code value="MID" />

<system value="http://hl7.org/fhir/v3/EntityNamePartQualifier2" />

</valueCoding>

</extension>

</given>

</name>

Later, Karin gets married to Per Berg, and decides to adopts Berg as her family name, and also decides to use Erikson as the mellom navn. (Note: Karin could have chosen to use another mellom navn, e.g. the family name of her mother, her father or other family names as specified by naming laws of the country in question).

<name>

<use value="old" />

<family value="Erikson" />

<given value="Karin" />

<given value="Hansen">

<extension>

<url value="http://hl7.org/fhir/profile/@iso-20190#name-qualifier" />

<valueCoding>

<code value="MID" />

<system value="http://hl7.org/fhir/v3/EntityNamePartQualifier2" />

</valueCoding>

</extension>

</given>

</name>

<name>

<use value="official" />

<family value="Berg" />

<given value="Karin" />

<given value="Erikson">

<extension>

<url value="http://hl7.org/fhir/profile/@iso-20190#name-qualifier" />

<valueCoding>

<code value="MID" />

<system value="http://hl7.org/fhir/v3/EntityNamePartQualifier2" />

</valueCoding>

</extension>

</given>

</name>

<name>

<use value="usual" />

<family value="Berg" />

<given value="Karin" />

</name>

#### 4.2.1.13: Address

#### 4.2.1.14: Contact

#### 4.2.1.15: Schedule

### 4.3.1: Person - Examples

This page contains two examples that demonstrate how to use extensions

#### 4.3.1.1: Patient Name Parts

ISO 21090 (Healthcare Data Types) defines a concept called a "name part qualifier" that contains extra information about how a particular name part should be used or interpreted. In practice, this field is used rarely, except in particular cultural contexts, where certain part qualifiers are used as a matter of practice. Following the [FHIR design policy](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility), such a field is not included in the overall definition of the core name data type, instead is it added as an extension.

In order to use an extension, there is a three step process:

1. Define the extension
2. Register the extension
3. Use it in the instance

In practice, for cases such as these in ISO 21090, HL7 provides common extensions, and these are defined at [location still to be finalized].

##### Define the Extension

For each extension, the first thing to do is to fill out the [definitional properties of the extension (§1.6.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#extensibility.define):

|  |  |
| --- | --- |
| Code | "name-qualifier" |
| Context | This extension can be used anywhere a HumanName.part appears |
| Short Defn | (one of the codes) AD | SP | BR | CL | IN | LS | MID | PFX | SFX |
| Definition | A set of codes each of which specifies a certain subcategory of the name part in addition to the main name part type |
| Comments | Used to indicate additional information about the name part and how it should be used |
| Cardinality | 0..\* (this is always optional, but more than one can be used if required) |
| Type | code |
| XPaths | N/A |
| Must Understand | No (Qualifiers are not required to be understood) |
| RIM Mapping | ENXP.qualifier |
| v2 Mapping | N/A |
| Binding | Bound to a subset of the codes specified for [EntityNamePartQualifierR2 in ISO 21090 (http://www.hl7.org/v3ballot/html/infrastructure/vocabulary/EntityNamePartQualifierR2.html)](http://www.hl7.org/v3ballot/html/infrastructure/vocabulary/EntityNamePartQualifierR2.html) |

Not all the codes of the EntityNamePartQualifierR2 are required in this context, because prefix and suffix are explicitly part of the name types. Rather than simply refer to the OID for EntityNamePartQualifierR2 (2.16.840.1.113883.5.1122), in this case we enumerate the available codes, and set the type of the extension to code. The type of "code" is only allowed if the profile itself defines the codes that can be used. Here is a table of the codes (see the [EntityNamePartQualifierR2 (http://www.hl7.org/v3ballot/html/infrastructure/vocabulary/EntityNamePartQualifierR2.html)](http://www.hl7.org/v3ballot/html/infrastructure/vocabulary/EntityNamePartQualifierR2.html) reference for the full definitions):

|  |  |  |
| --- | --- | --- |
| LS | Legal status | For organizations a suffix... |
| AC | Academic | Indicates that a prefix like "D... |
| NB | Nobility | In Europe and Asia, there are s... |
| PR | Professional | Primarily in the British Im... |
| HON | Honorific | An honorific such as 'The Rig... |
| BR | Birth | A name that a person was given at ... |
| AD | Acquired | A name part a person acquired. ... |
| SP | Spouse | The name assumed from the partner... |
| MID | Middle Name | Indicates that the name par... |
| CL | Call me | Callme is used to indicate which... |
| IN | Initial | Indicates that a name part is ju... |

This is all then represented formally in a profile. Such profiles do not need to include constraint statements of resources; instead, they include just extension declarations and their associated bindings. In this case, the profile looks like this:

<Profile xmlns="http://hl7.org/fhir">

<name value="iso-21090" />

<!-- snip other metadata -->

<extensionDefn>

<id value="name-qualifier" />

<context value="HumanName.given;HumanName.prefix;HumanName.family;HumanName.suffix" />

<contextType value="datatype" />

<definition>

<short value="AD | SP | BR | CL | IN | LS | MID | PFX | SFX" />

<formal value="A set of codes each of which specifies a certain subcategory

of the name part in addition to the main name part type" />

<comments value="Used to indicate additional information about the

name part and how it should be used" />

<min value="0" />

<max value="\*" />

<type>

<code value="code" />

</type>

<mustSupport value="false" />

<mustUnderstand value="false" />

<binding value="EntityNamePartQualifier" />

<mapping>

<target value="RIM" />

<map value="ENXP.qualifier" />

</mapping>

</definition>

</extensionDefn>

<binding>

<name value="EntityNamePartQualifier" />

<definition value="A set of codes each of which specifies a certain subcategory

of the name part in addition to the main name part type" />

<type value="codelist" />

<isExtensible value="codelist" />

<conformance value="required" />

<reference value="http://hl7.org/fhir/valueset/@name-part-qualifier" />

<concept>

<code value="LS" />

<system value="http://hl7.org/fhir/v3/EntityNamePartQualifier" />

<display value="Legal status" />

<definition value="For ..." /><!-- snip definition -->

</concept>

<!-- snip other codes -->

</binding>

<!-- snip narrative -->

</Profile>

Note that usually you would build the actual profile using some tool. This example was built from a spreadsheet definition by the FHIR build tooling.

##### Register the Extension

For this example, it is registered at [http://hl7.org/fhir/profile/@iso-21090 (http://hl7.org/fhir/profile/@iso-21090?format=text/html)](http://hl7.org/fhir/profile/@iso-21090?format=text/html) . This is the url that will appear in the definition element when the extension is used.

##### Use it in the instance

To using the extension in an instance, the extension is nested within the attribute that is extended. Note that the url of the extension refers to the registered location, with the id of the extension as a fragment identifier.

<name>

<use value="official" />

<given value="Östlund">

<extension>

<url value="http://hl7.org/fhir/profile/@iso-21090#name-qualifier" />

<valueCode value="MID" />

</extension>

</given>

</name>

This particular example is a Scandavian mellannamn. See [Datatypes examples for additional examples (§4.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes-examples).

## 4.4: Examples: AdverseReaction

Examples for the [AdverseReaction (§3.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction) resource.

#### 4.4.0.2: General

Example of adversereaction

Example of adversereaction (id = "example")

<AdverseReaction xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Anaphylaxis Reaction to a bee sting**</div>

</text>

<reactionDate value="2012-09-17"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<didNotOccurFlag value="false"/>

<recorder>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</recorder>

<symptom>

<code>

<coding>

<system value="http://hl7.org/fhir/sid/icd-10"/>

<code value="T78.2"/>

<display value="Anaphylactic shock, unspecified"/>

</coding>

<text value="Anaphylaxis reaction"/>

</code>

<severity value="moderate"/>

</symptom>

<exposure>

<exposureDate value="2012-09-17"/>

<exposureType value="coincidental"/>

<substance>

<type value="[Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance)"/>

<reference value="[substance/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-example)"/>

</substance>

</exposure>

</AdverseReaction>

JSON Equivalent

Example of adversereaction

{"AdverseReaction": {

"exposure": [{

"substance": {

"type": {"value": "Substance"},

"reference": {"value": "substance/@example"}

},

"exposureType": {"value": "coincidental"},

"exposureDate": {"value": "2012-09-17"}

}],

"didNotOccurFlag": {"value": "false"},

"text": {

"status": {"value": "generated"},

"div": "<div>Anaphylaxis Reaction to a bee sting<\/div>"

},

"reactionDate": {"value": "2012-09-17"},

"recorder": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"symptom": [{

"severity": {"value": "moderate"},

"code": {

"text": {"value": "Anaphylaxis reaction"},

"coding": [{

"system": {"value": "http://hl7.org/fhir/sid/icd-10"},

"display": {"value": "Anaphylactic shock, unspecified"},

"code": {"value": "T78.2"}

}]

}

}]

}}

## 4.5: Examples: Alert

Examples for the [Alert (§3.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert) resource.

#### 4.5.0.3: General

Example of alert

Example of alert (id = "example")

<Alert xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Large Dog warning**</div>

</text>

<category>

<coding>

<system value="local"/>

<code value="admin"/>

<display value="Admin"/>

</coding>

<text value="admin"/>

</category>

<status value="active"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

<display value="Peter Patient"/>

</subject>

<author>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

<display value="Nancy Nurse"/>

</author>

<note value="patient has a big dog at his home. Always carry a slab of meat to pacify it"/>

</Alert>

JSON Equivalent

Example of alert

{"Alert": {

"author": {

"display": {"value": "Nancy Nurse"},

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"category": {

"text": {"value": "admin"},

"coding": [{

"system": {"value": "local"},

"display": {"value": "Admin"},

"code": {"value": "admin"}

}]

},

"text": {

"status": {"value": "generated"},

"div": "<div>Large Dog warning<\/div>"

},

"status": {"value": "active"},

"subject": {

"display": {"value": "Peter Patient"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"note": {"value": "patient has a big dog at his home. Always carry a slab of meat to pacify it"}

}}

## 4.6: Examples: AllergyIntolerance

Examples for the [AllergyIntolerance (§3.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance) resource.

#### 4.6.0.4: Bee stings

General Person Example

General Person Example (id = "example")

<AllergyIntolerance xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Sensitivity to Bee Stings**</div>

</text>

<criticality value="fatal"/>

<sensitivityType value="allergy"/>

<recordedDate value="2012-09-17"/>

<status value="confirmed"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<recorder>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</recorder>

<substance>

<type value="[Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance)"/>

<reference value="[substance/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance-example)"/>

</substance>

<reactions>

<type value="[AdverseReaction](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction)"/>

<reference value="[adversereaction/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction-example)"/>

</reactions>

<sensitivityTest>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="[observation/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-example)"/>

</sensitivityTest>

</AllergyIntolerance>

JSON Equivalent

General Person Example

{"AllergyIntolerance": {

"sensitivityTest": [{

"type": {"value": "Observation"},

"reference": {"value": "observation/@example"}

}],

"substance": {

"type": {"value": "Substance"},

"reference": {"value": "substance/@example"}

},

"criticality": {"value": "fatal"},

"text": {

"status": {"value": "generated"},

"div": "<div>Sensitivity to Bee Stings<\/div>"

},

"reactions": [{

"type": {"value": "AdverseReaction"},

"reference": {"value": "adversereaction/@example"}

}],

"status": {"value": "confirmed"},

"sensitivityType": {"value": "allergy"},

"recorder": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"recordedDate": {"value": "2012-09-17"}

}}

## 4.7: Examples: CarePlan

Examples for the [CarePlan (§3.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan) resource.

#### 4.7.0.5: Weight Loss

General Person Example

General Person Example (id = "example")

<CarePlan xmlns="http://hl7.org/fhir">

<text>

<status value="additional"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p> **A simple care plan to indicate a patient taking their weight once a day because of obesity.**

**Some Notes:** </p>

<ul>

<li>**It would be good to have some way of specifying/coding a goal. eg what the target weight is**</li>

<li>**In the codeable concepts I've been lazy and just put the text. There should, of course, be a code behind these**</li>

</ul>

</div>

</text>

<contained>

<Condition id="p1">

<subject>

<type value="Patient"/>

<reference value="patient/@example"/>

<display value="Peter James Chalmers"/>

</subject>

<code>

<text value="Obesity"/>

</code>

<status value="confirmed"/>

</Condition>

</contained>

<contained>

<Practitioner id="pr1">

<name>

<family value="Dietician"/>

<given value="Dorothy"/>

</name>

<specialty>

<text value="Dietician"/>

</specialty>

</Practitioner>

</contained>

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

<display value="Peter James Chalmers"/>

</patient>

<status value="active"/>

<period>

<end value="2013-01-01"/>

</period>

<concern>

<type value="[Condition](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition)"/>

<reference value="#p1"/>

<display value="obesity"/>

</concern>

<participant>

<role>

<text value="responsiblePerson"/>

</role>

<member>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

<display value="Peter James Chalmers"/>

</member>

</participant>

<participant>

<role>

<text value="adviser"/>

</role>

<member>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#pr1"/>

<display value="Dorothy Dietician"/>

</member>

</participant>

<goal>

<description value="Target weight is 80 kg. Note: be nice if this could be coded"/>

</goal>

<activity>

<category value="observation"/>

<code>

<text value="a code for weight measurement"/>

</code>

<prohibited value="false"/>

<timingSchedule>

<repeat>

<frequency value="1"/>

<duration value="1"/>

<units value="d"/>

</repeat>

</timingSchedule>

<performer>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

<display value="Peter James Chalmers"/>

</performer>

</activity>

</CarePlan>

JSON Equivalent

General Person Example

{"CarePlan": {

"text": {

"status": {"value": "additional"},

"div": "<div>\n <p> A simple care plan to indicate a patient taking their weight once a day because of obesity.\n Some Notes: <\/p>\n <ul>\n <li>It would be good to have some way of specifying/coding a goal. eg what the target weight is<\/li>\n <li>In the codeable concepts I've been lazy and just put the text. There should, of course, be a code behind these<\/li>\n <\/ul>\n <\/div>"

},

"patient": {

"display": {"value": "Peter James Chalmers"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"status": {"value": "active"},

"concern": [{

"display": {"value": "obesity"},

"type": {"value": "Condition"},

"reference": {"value": "#p1"}

}],

"participant": [

{

"member": {

"display": {"value": "Peter James Chalmers"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"role": {"text": {"value": "responsiblePerson"}}

},

{

"member": {

"display": {"value": "Dorothy Dietician"},

"type": {"value": "Practitioner"},

"reference": {"value": "#pr1"}

},

"role": {"text": {"value": "adviser"}}

}

],

"contained": [

{"Condition": {

"\_id": "p1",

"status": {"value": "confirmed"},

"subject": {

"display": {"value": "Peter James Chalmers"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"code": {"text": {"value": "Obesity"}}

}},

{"Practitioner": {

"\_id": "pr1",

"name": {

"given": [{"value": "Dorothy"}],

"family": [{"value": "Dietician"}]

},

"specialty": [{"text": {"value": "Dietician"}}]

}}

],

"period": {"end": {"value": "2013-01-01"}},

"activity": [{

"timingSchedule": {"repeat": {

"duration": {"value": "1"},

"frequency": {"value": "1"},

"units": {"value": "d"}

}},

"category": {"value": "observation"},

"prohibited": {"value": "false"},

"performer": [{

"display": {"value": "Peter James Chalmers"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

}],

"code": {"text": {"value": "a code for weight measurement"}}

}],

"goal": [{"description": {"value": "Target weight is 80 kg. Note: be nice if this could be coded"}}]

}}

#### 4.7.0.6: Pregnancy

Patient 1 for linking

Patient 1 for linking (id = "preg")

<CarePlan xmlns="http://hl7.org/fhir">

<!-- an extension to record the LMP, which is required at the plan level... -->

<extension>

<url value="http://exampleDoNotUse/careplan#lmp"/>

<valueDateTime value="2013-01-01"/>

</extension>

<text>

<status value="additional"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**A maternity care plan (for a pregnant woman).**</p>

<p>**LMP is 1st Jan, 2013 (a great new year’s party!) The plan has a scheduled first antenatal,**

**and 'placeholders' for the second antenatal and delivery (there would be lots of others of course)**</p>

<p>**Note that where is a proposed 'status' element against each activity**</p>

</div>

</text>

<contained>

<Condition id="p1">

<subject>

<type value="Patient"/>

<reference value="patient/@1"/>

<display value="Eve Everywoman"/>

</subject>

<code>

<text value="pregnancy"/>

</code>

<status value="confirmed"/>

</Condition>

</contained>

<contained>

<Practitioner id="pr1">

<name>

<family value="Midwife"/>

<given value="Mavis"/>

</name>

<specialty>

<text value="Midwife"/>

</specialty>

</Practitioner>

</contained>

<contained>

<Practitioner id="pr2">

<name>

<family value="Obstetrician"/>

<given value="Oscar"/>

</name>

<specialty>

<text value="Obstetrician"/>

</specialty>

</Practitioner>

</contained>

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="patient/@1"/>

<display value="Eve Everywoman"/>

</patient>

<status value="active"/>

<period>

<!-- The likely duration of the pregnancy -->

<start value="2013-01-01"/>

<end value="2013-10-01"/>

</period>

<concern>

<type value="[Condition](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition)"/>

<reference value="#p1"/>

<display value="pregnancy"/>

</concern>

<participant>

<!-- In New Zealand, there is a Lead Maternity Carer (LMC) - often a midwife -->

<role>

<coding>

<system value="mySys"/>

<code value="lmc"/>

</coding>

<text value="Mid Wife"/>

</role>

<member>

<!-- This links to the clinician resource, so we get all the stuff related to that like address, contact etc... -->

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#pr1"/>

<display value="Mavis Midwife"/>

</member>

</participant>

<participant>

<!-- To indicate that there is an obstetrician consultant involved in this case. -->

<role>

<coding>

<system value="mySys"/>

<code value="obs"/>

</coding>

<text value="Obstetrician"/>

</role>

<member>

<!-- This links to the clinician resource, so we get all the stuff related to that like address, contact etc... -->

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#pr2"/>

<display value="Oscar Obstetrician"/>

</member>

</participant>

<goal>

<description value="Maintain a woman’s health throughout pregnancy and ensure a healthy child"/>

</goal>

<activity>

<!-- This will be the first antenatal encounter -->

<!-- a link to further details about the first antenatal details -->

<extension>

<url value="http://exampleDoNotUse/careplan#andetails"/>

<valueUri value="http://orionhealth.com/fhir/careplan/1andetails"/>

</extension>

<category value="encounter"/>

<code>

<coding>

<system value="mySystem"/>

<code value="1an"/>

</coding>

<text value="First Antenatal encounter"/>

</code>

<status value="scheduled"/>

<prohibited value="false"/>

<timingSchedule>

<!-- The encounter should occur between 14 feb and 28 feb -->

<event>

<start value="2013-02-14"/>

<end value="2013-02-28"/>

</event>

</timingSchedule>

<performer>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#pr1"/>

<display value="Mavis Midwife"/>

</performer>

<details value="The first antenatal encounter. This is where a detailed physical examination is performed. and the pregnancy discussed with the mother-to-be."/>

<!-- This is a booked encounter with Mavis Midwife for the first antenatal check-up.

This entry is only made after the appointment (a planned encounter) has been made.

Commented out for now because Encounter hasn't been defined yet

&lt;actionTaken&gt;

&lt;type value=&quot;Encounter&quot;&gt;&lt;/type&gt;

&lt;url value=&quot;xxx&quot;/&gt;

&lt;display value=&quot;Appointment with Mavis midwife @12.30pm, 112 St Albans Ave&quot;/&gt;

&lt;/actionTaken&gt; -->

</activity>

<activity>

<!-- This will be the second antenatal encounter - 3 months after LMP. It is not yet scheduled. -->

<category value="encounter"/>

<code>

<!-- The code is just for an antenatal encounter. There are many of these, the first is special... -->

<coding>

<system value="mySystem"/>

<code value="an"/>

</coding>

<text value="Follow-up Antenatal encounter"/>

</code>

<status value="not started"/>

<prohibited value="false"/>

<timingSchedule>

<!-- The encounter should occur between 1 march and 14 march -->

<event>

<start value="2013-03-01"/>

<end value="2013-03-14"/>

</event>

</timingSchedule>

<performer>

<!-- The performer is known, but the actual appointment is not yet made, hence there is no action element... -->

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#pr1"/>

<display value="Mavis Midwife"/>

</performer>

<details value="The second antenatal encounter. Discuss any issues that arose from the first antenatal encounter"/>

</activity>

<!--

There would be a number of other encounters to be scheduled here...

...

...

-->

<activity>

<!-- This will be the delivery. It is not yet scheduled. -->

<category value="encounter"/>

<code>

<coding>

<system value="mySystem"/>

<code value="del"/>

</coding>

<text value="Delivery"/>

</code>

<status value="not started"/>

<prohibited value="false"/>

<timingSchedule>

<!-- The delivery should occur between 1 September and 14 September -->

<event>

<start value="2013-09-01"/>

<end value="2013-09-14"/>

</event>

</timingSchedule>

<!-- Where the delivery is to occur...

Commented out for now because location resource isn't defined

&lt;location&gt;

&lt;type value=&quot;Location&quot;&gt;&lt;/type&gt;

&lt;url value=&quot;loc100&quot;/&gt;

&lt;display value=&quot;St Albans delivery suite&quot;/&gt;

&lt;/location&gt; -->

<performer>

<!-- The intention is that Maris will be performing the delivery... -->

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#pr1"/>

<display value="Mavis Midwife"/>

</performer>

<details value="The delivery."/>

</activity>

</CarePlan>

JSON Equivalent

Patient 1 for linking

{"CarePlan": {

"extension": [{

"valueDateTime": {"value": "2013-01-01"},

"url": {"value": "http://exampleDoNotUse/careplan#lmp"}

}],

"text": {

"status": {"value": "additional"},

"div": "<div>\n <p>A maternity care plan (for a pregnant woman).<\/p> \n <p>LMP is 1st Jan, 2013 (a great new year’s party!) The plan has a scheduled first antenatal,\n and 'placeholders' for the second antenatal and delivery (there would be lots of others of course)<\/p>\n <p>Note that where is a proposed 'status' element against each activity<\/p>\n <\/div>"

},

"patient": {

"display": {"value": "Eve Everywoman"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@1"}

},

"status": {"value": "active"},

"concern": [{

"display": {"value": "pregnancy"},

"type": {"value": "Condition"},

"reference": {"value": "#p1"}

}],

"participant": [

{

"member": {

"display": {"value": "Mavis Midwife"},

"type": {"value": "Practitioner"},

"reference": {"value": "#pr1"}

},

"role": {

"text": {"value": "Mid Wife"},

"coding": [{

"system": {"value": "mySys"},

"code": {"value": "lmc"}

}]

}

},

{

"member": {

"display": {"value": "Oscar Obstetrician"},

"type": {"value": "Practitioner"},

"reference": {"value": "#pr2"}

},

"role": {

"text": {"value": "Obstetrician"},

"coding": [{

"system": {"value": "mySys"},

"code": {"value": "obs"}

}]

}

}

],

"contained": [

{"Condition": {

"\_id": "p1",

"status": {"value": "confirmed"},

"subject": {

"display": {"value": "Eve Everywoman"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@1"}

},

"code": {"text": {"value": "pregnancy"}}

}},

{"Practitioner": {

"\_id": "pr1",

"name": {

"given": [{"value": "Mavis"}],

"family": [{"value": "Midwife"}]

},

"specialty": [{"text": {"value": "Midwife"}}]

}},

{"Practitioner": {

"\_id": "pr2",

"name": {

"given": [{"value": "Oscar"}],

"family": [{"value": "Obstetrician"}]

},

"specialty": [{"text": {"value": "Obstetrician"}}]

}}

],

"period": {

"start": {"value": "2013-01-01"},

"end": {"value": "2013-10-01"}

},

"activity": [

{

"timingSchedule": {"event": [{

"start": {"value": "2013-02-14"},

"end": {"value": "2013-02-28"}

}]},

"extension": [{

"valueUri": {"value": "http://orionhealth.com/fhir/careplan/1andetails"},

"url": {"value": "http://exampleDoNotUse/careplan#andetails"}

}],

"category": {"value": "encounter"},

"details": {"value": "The first antenatal encounter. This is where a detailed physical examination is performed. and the pregnancy discussed with the mother-to-be."},

"status": {"value": "scheduled"},

"prohibited": {"value": "false"},

"performer": [{

"display": {"value": "Mavis Midwife"},

"type": {"value": "Practitioner"},

"reference": {"value": "#pr1"}

}],

"code": {

"text": {"value": "First Antenatal encounter"},

"coding": [{

"system": {"value": "mySystem"},

"code": {"value": "1an"}

}]

}

},

{

"timingSchedule": {"event": [{

"start": {"value": "2013-03-01"},

"end": {"value": "2013-03-14"}

}]},

"category": {"value": "encounter"},

"details": {"value": "The second antenatal encounter. Discuss any issues that arose from the first antenatal encounter"},

"status": {"value": "not started"},

"prohibited": {"value": "false"},

"performer": [{

"display": {"value": "Mavis Midwife"},

"type": {"value": "Practitioner"},

"reference": {"value": "#pr1"}

}],

"code": {

"text": {"value": "Follow-up Antenatal encounter"},

"coding": [{

"system": {"value": "mySystem"},

"code": {"value": "an"}

}]

}

},

{

"timingSchedule": {"event": [{

"start": {"value": "2013-09-01"},

"end": {"value": "2013-09-14"}

}]},

"category": {"value": "encounter"},

"details": {"value": "The delivery."},

"status": {"value": "not started"},

"prohibited": {"value": "false"},

"performer": [{

"display": {"value": "Mavis Midwife"},

"type": {"value": "Practitioner"},

"reference": {"value": "#pr1"}

}],

"code": {

"text": {"value": "Delivery"},

"coding": [{

"system": {"value": "mySystem"},

"code": {"value": "del"}

}]

}

}

],

"goal": [{"description": {"value": "Maintain a woman’s health throughout pregnancy and ensure a healthy child"}}]

}}

#### 4.7.0.7: GPVisit

Encounter to GP (Primary care Practitioner)

Encounter to GP (Primary care Practitioner) (id = "gpvisit")

<CarePlan xmlns="http://hl7.org/fhir">

<text>

<status value="additional"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p> **Represents the flow of a patient within a practice. The plan is created when**

**they arrive and represents the 'care' of the patient over the course of that encounter.**

**They first see the nurse for basic observations (BP, pulse, temp) then the doctor for**

**the consultation and finally the nurse again for a tetanus immunization. As the plan is**

**updated (eg a new activity added), different versions of the plan exist, and workflow timings**

**for reporting can be gained by examining the plan history. This example is the version after**

**seeing the doctor, and waiting for the nurse. The plan can either be created 'ad hoc' and modified as**

**the patient progresses, or start with a standard template (which can, of course, be altered to suit the patient.**</p>

</div>

</text>

<contained>

<!-- This is the reason for the encounter. It is referenced by the concern -->

<Condition id="p1">

<subject>

<type value="Patient"/>

<reference value="patient/@100"/>

<display value="Peter James Chalmers"/>

</subject>

<code>

<!-- Could be coded if we wanted to... -->

<text value="Overseas encounter"/>

</code>

<status value="confirmed"/>

</Condition>

</contained>

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="patient/@100"/>

<display value="Peter James Chalmers"/>

</patient>

<status value="active"/>

<period>

<!-- This is the time the plan started - ie when they arrived -->

<start value="2013-01-01T10:30:00+00:00"/>

<!-- No end yet as the encounter is still in progress. -->

</period>

<concern>

<type value="[Condition](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition)"/>

<reference value="#p1"/>

<display value="obesity"/>

</concern>

<participant id="part1">

<role>

<coding>

<system value="local"/>

<code value="nur"/>

</coding>

<text value="nurse"/>

</role>

<member>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="practitioner/@13"/>

<display value="Nurse Nancy"/>

</member>

</participant>

<participant id="part2">

<role>

<coding>

<system value="local"/>

<code value="doc"/>

</coding>

<text value="doctor"/>

</role>

<member>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="practitioner/@14"/>

<display value="Doctor Dave"/>

</member>

</participant>

<goal>

<description value="Complete consultation"/>

</goal>

<activity>

<!-- This activity is for the initial nurse encounter where vitals are taken. It has been completed. -->

<category value="encounter"/>

<code>

<coding>

<system value="local"/>

<code value="nursecon"/>

</coding>

<text value="Nurse Consultation"/>

</code>

<status value="completed"/>

<prohibited value="false"/>

<timingPeriod>

<!-- the nurse saw the patient between 10:38 and 10:50 -->

<start value="2013-01-01T10:38:00+00:00"/>

<end value="2013-01-01T10:50:00+00:00"/>

</timingPeriod>

<performer>

<!-- refer to the participant (the nurse) in this resource -->

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="practitioner/@13"/>

<display value="Nurse Nancy"/>

</performer>

<actionTaken>

<!-- This is a link to the nurse encounter. The assumption is that all contacts with practitioners

are modelled as separate encounters. Ideally, there will be a 'master/parent' encounter that ties them together.

If there is a single encounter, then all participants will be linked to that encounter. -->

<type value="[Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter)"/>

<reference value="[encounter/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-example)"/>

</actionTaken>

</activity>

<activity>

<!-- This activity is for the encounter with the doctor. It is scheduled, but not yet started,

so there is no timing[x] or actionTaken element yet -->

<category value="encounter"/>

<code>

<coding>

<system value="local"/>

<code value="doccon"/>

</coding>

<text value="Doctor Consultation"/>

</code>

<!-- The status is 'scheduled' so the doctor knows the patient is waiting. -->

<status value="scheduled"/>

<prohibited value="false"/>

<performer>

<!-- refer to the participant (the nurse) in this resource -->

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="practitioner/@14"/>

<display value="Doctor Dave"/>

</performer>

</activity>

</CarePlan>

JSON Equivalent

Encounter to GP (Primary care Practitioner)

{"CarePlan": {

"text": {

"status": {"value": "additional"},

"div": "<div>\n <p> Represents the flow of a patient within a practice. The plan is created when\n they arrive and represents the 'care' of the patient over the course of that encounter.\n They first see the nurse for basic observations (BP, pulse, temp) then the doctor for\n the consultation and finally the nurse again for a tetanus immunization. As the plan is\n updated (eg a new activity added), different versions of the plan exist, and workflow timings\n for reporting can be gained by examining the plan history. This example is the version after\n seeing the doctor, and waiting for the nurse. The plan can either be created 'ad hoc' and modified as\n the patient progresses, or start with a standard template (which can, of course, be altered to suit the patient.<\/p>\n <\/div>"

},

"patient": {

"display": {"value": "Peter James Chalmers"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@100"}

},

"status": {"value": "active"},

"concern": [{

"display": {"value": "obesity"},

"type": {"value": "Condition"},

"reference": {"value": "#p1"}

}],

"participant": [

{

"member": {

"display": {"value": "Nurse Nancy"},

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@13"}

},

"\_id": "part1",

"role": {

"text": {"value": "nurse"},

"coding": [{

"system": {"value": "local"},

"code": {"value": "nur"}

}]

}

},

{

"member": {

"display": {"value": "Doctor Dave"},

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@14"}

},

"\_id": "part2",

"role": {

"text": {"value": "doctor"},

"coding": [{

"system": {"value": "local"},

"code": {"value": "doc"}

}]

}

}

],

"contained": [{"Condition": {

"\_id": "p1",

"status": {"value": "confirmed"},

"subject": {

"display": {"value": "Peter James Chalmers"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@100"}

},

"code": {"text": {"value": "Overseas encounter"}}

}}],

"period": {"start": {"value": "2013-01-01T10:30:00+00:00"}},

"activity": [

{

"timingPeriod": {

"start": {"value": "2013-01-01T10:38:00+00:00"},

"end": {"value": "2013-01-01T10:50:00+00:00"}

},

"category": {"value": "encounter"},

"actionTaken": [{

"type": {"value": "Encounter"},

"reference": {"value": "encounter/@example"}

}],

"status": {"value": "completed"},

"prohibited": {"value": "false"},

"performer": [{

"display": {"value": "Nurse Nancy"},

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@13"}

}],

"code": {

"text": {"value": "Nurse Consultation"},

"coding": [{

"system": {"value": "local"},

"code": {"value": "nursecon"}

}]

}

},

{

"category": {"value": "encounter"},

"status": {"value": "scheduled"},

"prohibited": {"value": "false"},

"performer": [{

"display": {"value": "Doctor Dave"},

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@14"}

}],

"code": {

"text": {"value": "Doctor Consultation"},

"coding": [{

"system": {"value": "local"},

"code": {"value": "doccon"}

}]

}

}

],

"goal": [{"description": {"value": "Complete consultation"}}]

}}

## 4.8: Examples: Condition

Examples for the [Condition (§3.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition) resource.

#### 4.8.0.8: General

General Condition Example

General Condition Example (id = "example")

<Condition xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Severe burn of left ear (Date: 24-May 2012)**</div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<code>

<coding>

<system value="http://snomed.info"/>

<code value="39065001"/>

<display value="Burn of ear"/>

</coding>

<text value="Burnt Ear"/>

</code>

<category>

<coding>

<system value="http://hl7.org/fhir/condition-category"/>

<code value="diagnosis"/>

<display value="Diagnosis"/>

</coding>

<!-- and also a snomed coding -->

<coding>

<system value="http://snomed.info"/>

<code value="439401001"/>

<display value="Diagnosis"/>

</coding>

</category>

<status value="confirmed"/>

<severity>

<coding>

<system value="http://snomed.info"/>

<code value="24484000"/>

<display value="Severe"/>

</coding>

</severity>

<onsetDate value="2012-05-24"/>

<location>

<code>

<coding>

<system value="http://snomed.info"/>

<code value="49521004"/>

<display value="Left external ear structure"/>

</coding>

<text value="Left Ear"/>

</code>

</location>

</Condition>

JSON Equivalent

General Condition Example

{"Condition": {

"category": {"coding": [

{

"system": {"value": "http://hl7.org/fhir/condition-category"},

"display": {"value": "Diagnosis"},

"code": {"value": "diagnosis"}

},

{

"system": {"value": "http://snomed.info"},

"display": {"value": "Diagnosis"},

"code": {"value": "439401001"}

}

]},

"text": {

"status": {"value": "generated"},

"div": "<div>Severe burn of left ear (Date: 24-May 2012)<\/div>"

},

"location": [{"code": {

"text": {"value": "Left Ear"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Left external ear structure"},

"code": {"value": "49521004"}

}]

}}],

"status": {"value": "confirmed"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"severity": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Severe"},

"code": {"value": "24484000"}

}]},

"onsetDate": {"value": "2012-05-24"},

"code": {

"text": {"value": "Burnt Ear"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Burn of ear"},

"code": {"value": "39065001"}

}]

}

}}

## 4.9: Examples: Conformance

Examples for the [Conformance (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) resource.

#### 4.9.0.9: General

General Condition Example

General Condition Example (id = "example")

<Conformance xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**The EHR Server supports the following transactions for the resource Person: read, vread,**

**update, history, search(name,gender), create and updates.**</p>

<p>**The EHR System supports the following message: admin-notify::Person.**</p>

<p>**The EHR Application has a** <a href="http://fhir.hl7.org/base/profile/@bc054d23-75e1-4dc6-aca5-838b6b1ac81d/history/@b5fdd9fc-b021-4ea1-911a-721a60663796">**general document profile**</a>**.**</p>

</div>

</text>

<!-- the identifier for this conformance statement.

The identifier and version establish identifiers that other specifications etc. may use to

refer to the conformance statement that this resource represents in a logical manner

rather than in a literal (URL) fashion

The identifier should be globally unique - a UUID, an OID, or a URL/URI

-->

<identifier value="68D043B5-9ECF-4559-A57A-396E0D452311"/>

<version value="20130510"/>

<publisher value="ACME Corporation"/>

<telecom>

<system value="email"/>

<value value="wile@acme.org"/>

</telecom>

<date value="2012-01-04"/>

<software>

<name value="EHR"/>

<version value="0.00.020.2134"/>

</software>

<!-- while the FHIR infrastructure is turning over prior to development, a version is

required. Note that this may be rescinded later? -->

<fhirVersion value="0.07"/>

<!-- this system accepts unknown content in the resources -->

<acceptUnknown value="true"/>

<!-- this system can do either xml or json. (Listing both implies full support for either, with interconversion) -->

<format value="xml"/>

<format value="json"/>

<!-- in a real conformance statement, it's unlikely that a single conformance statement

would declare conformance for REST, messaging and documents, though it is legal.

This example does so in order to show all the parts of a conformance statement -->

<rest>

<!-- this is a server conformance statement. Note that servers are required to provide

one of these. It can easily be edited by hand - copy this, replace the metadata above,

delete the messaging and document stuff below, and then replace the details appropriately. -->

<mode value="server"/>

<!-- zero or more of these - declaration of support for a resource -->

<resource>

<type value="Patient"/>

<!-- let's assume that HL7 has stood up a profile registry at http://fhir.hl7.org/fhir

- it's likely to have a registry, though this is not decided, nor is a URL decided.

This application simply uses a profile registered directly with HL7. For the simplest

case of a FHIR REST Server, just delete this profile reference. Profile references do

not need to be a UUID, though a profile registry could insist that they are -->

<profile>

<type value="[Profile](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile)"/>

<reference value="http://fhir.hl7.org/base/profile/@7896271d-57f6-4231-89dc-dcc91eab2416"/>

</profile>

<operation>

<code value="read"/>

</operation>

<operation>

<code value="vread"/>

</operation>

<operation>

<code value="update"/>

</operation>

<operation>

<code value="history-instance"/>

</operation>

<operation>

<code value="create"/>

</operation>

<operation>

<code value="history-type"/>

</operation>

</resource>

<batch value="true"/>

<history value="true"/>

</rest>

<!-- a messaging conformance statement. Applications are not required to make a conformance

statement with regard to messaging, though there is active argument that they should. -->

<messaging>

<!-- how to tell whether this llp is a server or a client? -->

<event>

<code value="admin-notify"/>

<mode value="receiver"/><!-- this a receiver - i.e. answers. Not necessarily a server&quot; -->

<focus value="Patient"/>

<!-- specify a profile for the request person. Very often there's no point profiling

the response, it's not interesting -->

<request>

<type value="[Profile](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile)"/>

<reference value="[profile/@101](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-example)"/>

</request>

<response>

<type value="[Profile](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile)"/>

<reference value="[profile/@101](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile-example)"/>

</response>

</event>

</messaging>

<!-- a document conformance statement -->

<document>

<mode value="consumer"/>

<documentation value="Basic rules for all documents in the EHR system"/>

<!-- this is the important element: a reference to a published document profile

note that this is a version specific reference. -->

<profile>

<type value="[Profile](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile)"/>

<reference value="http://fhir.hl7.org/base/profile/@bc054d23-75e1-4dc6-aca5-838b6b1ac81d/history/@b5fdd9fc-b021-4ea1-911a-721a60663796"/>

</profile>

</document>

</Conformance>

JSON Equivalent

General Condition Example

{"Conformance": {

"acceptUnknown": {"value": "true"},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>The EHR Server supports the following transactions for the resource Person: read, vread, \n update, history, search(name,gender), create and updates.<\/p>\n <p>The EHR System supports the following message: admin-notify::Person.<\/p>\n <p>The EHR Application has a <a href=\"http://fhir.hl7.org/base/profile/@bc054d23-75e1-4dc6-aca5-838b6b1ac81d/history/@b5fdd9fc-b021-4ea1-911a-721a60663796\">general document profile<\/a>.<\/p>\n <\/div>"

},

"format": [

{"value": "xml"},

{"value": "json"}

],

"date": {"value": "2012-01-04"},

"version": {"value": "20130510"},

"publisher": {"value": "ACME Corporation"},

"software": {

"name": {"value": "EHR"},

"version": {"value": "0.00.020.2134"}

},

"document": [{

"documentation": {"value": "Basic rules for all documents in the EHR system"},

"profile": {

"type": {"value": "Profile"},

"reference": {"value": "http://fhir.hl7.org/base/profile/@bc054d23-75e1-4dc6-aca5-838b6b1ac81d/history/@b5fdd9fc-b021-4ea1-911a-721a60663796"}

},

"mode": {"value": "consumer"}

}],

"fhirVersion": {"value": "0.07"},

"telecom": [{

"system": {"value": "email"},

"value": {"value": "wile@acme.org"}

}],

"messaging": [{"event": [{

"response": {

"type": {"value": "Profile"},

"reference": {"value": "profile/@101"}

},

"request": {

"type": {"value": "Profile"},

"reference": {"value": "profile/@101"}

},

"focus": {"value": "Patient"},

"code": {"value": "admin-notify"},

"mode": {"value": "receiver"}

}]}],

"rest": [{

"history": {"value": "true"},

"batch": {"value": "true"},

"resource": [{

"operation": [

{"code": {"value": "read"}},

{"code": {"value": "vread"}},

{"code": {"value": "update"}},

{"code": {"value": "history-instance"}},

{"code": {"value": "create"}},

{"code": {"value": "history-type"}}

],

"type": {"value": "Patient"},

"profile": {

"type": {"value": "Profile"},

"reference": {"value": "http://fhir.hl7.org/base/profile/@7896271d-57f6-4231-89dc-dcc91eab2416"}

}

}],

"mode": {"value": "server"}

}],

"identifier": {"value": "68D043B5-9ECF-4559-A57A-396E0D452311"}

}}

## 4.10: Examples: Coverage

Examples for the [Coverage (§3.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage) resource.

#### 4.10.0.10: General-Primary

General Person Primary Coverage Example

General Person Primary Coverage Example (id = "9876B1")

<Coverage xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**A human readable rendering of the coverage**</div>

</text>

<issuer>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@2](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-insurer)"/>

</issuer>

<period>

<start value="2011-05-23"/>

<end value="2012-05-23"/>

</period>

<type>

<system value="http://hl7.org/fhir/v3/ActCode"/>

<code value="EHCPOL"/>

<display value="extended healthcare"/>

</type>

<identifier>

<system value="http://xyz.com/codes/identifier"/>

<key value="12345"/>

</identifier>

<plan>

<system value="http://xyz.com/codes/plan"/>

<key value="CBI35"/>

</plan>

<subplan>

<system value="http://xyz.com/codes/subplan"/>

<key value="123"/>

</subplan>

<dependent value="0"/>

<sequence value="1"/>

<subscriber>

<name>

<use value="official"/>

<family value="Seebetter"/>

<given value="Wanda"/>

<given value="L"/>

</name>

<address>

<use value="home"/>

<line value="123 Any St"/>

<city value="Anytown"/>

<state value="BC"/>

<zip value="V3R4R5"/>

<country value="CANADA"/>

</address>

<birthdate value="1955-01-01"/>

</subscriber>

</Coverage>

JSON Equivalent

General Person Primary Coverage Example

{"Coverage": {

"text": {

"status": {"value": "generated"},

"div": "<div>A human readable rendering of the coverage<\/div>"

},

"plan": {

"system": {"value": "http://xyz.com/codes/plan"},

"key": {"value": "CBI35"}

},

"issuer": {

"type": {"value": "Organization"},

"reference": {"value": "organization/@2"}

},

"sequence": {"value": "1"},

"dependent": {"value": "0"},

"type": {

"system": {"value": "http://hl7.org/fhir/v3/ActCode"},

"display": {"value": "extended healthcare"},

"code": {"value": "EHCPOL"}

},

"period": {

"start": {"value": "2011-05-23"},

"end": {"value": "2012-05-23"}

},

"subscriber": {

"address": {

"zip": {"value": "V3R4R5"},

"state": {"value": "BC"},

"line": [{"value": "123 Any St"}],

"use": {"value": "home"},

"country": {"value": "CANADA"},

"city": {"value": "Anytown"}

},

"name": {

"given": [

{"value": "Wanda"},

{"value": "L"}

],

"family": [{"value": "Seebetter"}],

"use": {"value": "official"}

},

"birthdate": {"value": "1955-01-01"}

},

"identifier": {

"system": {"value": "http://xyz.com/codes/identifier"},

"key": {"value": "12345"}

},

"subplan": {

"system": {"value": "http://xyz.com/codes/subplan"},

"key": {"value": "123"}

}

}}

#### 4.10.0.11: General-Secondary

General Person Secondary Coverage Example

General Person Secondary Coverage Example (id = "7546D")

<Coverage xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**A human readable rendering of the coverage**</div>

</text>

<issuer>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@2](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-insurer)"/>

</issuer>

<period>

<start value="2011-03-17"/>

<end value="2012-03-17"/>

</period>

<type>

<system value="http://hl7.org/fhir/v3/ActCode"/>

<code value="EHCPOL"/>

<display value="extended healthcare"/>

</type>

<identifier>

<system value="http://xyz.com/codes/identifier"/>

<key value="AB9876"/>

</identifier>

<plan>

<system value="http://xyz.com/codes/plan"/>

<key value="11024"/>

</plan>

<subplan>

<system value="http://xyz.com/codes/subplan"/>

<key value="D15C9"/>

</subplan>

<dependent value="1"/>

<subscriber>

<name>

<use value="official"/>

<family value="Seebetter"/>

<given value="Frank"/>

<given value="I"/>

</name>

<address>

<use value="home"/>

<line value="123 Any St"/>

<city value="Anytown"/>

<state value="BC"/>

<zip value="V3R4R5"/>

<country value="CANADA"/>

</address>

<birthdate value="1952-06-26"/>

</subscriber>

</Coverage>

JSON Equivalent

General Person Secondary Coverage Example

{"Coverage": {

"text": {

"status": {"value": "generated"},

"div": "<div>A human readable rendering of the coverage<\/div>"

},

"plan": {

"system": {"value": "http://xyz.com/codes/plan"},

"key": {"value": "11024"}

},

"issuer": {

"type": {"value": "Organization"},

"reference": {"value": "organization/@2"}

},

"dependent": {"value": "1"},

"type": {

"system": {"value": "http://hl7.org/fhir/v3/ActCode"},

"display": {"value": "extended healthcare"},

"code": {"value": "EHCPOL"}

},

"period": {

"start": {"value": "2011-03-17"},

"end": {"value": "2012-03-17"}

},

"subscriber": {

"address": {

"zip": {"value": "V3R4R5"},

"state": {"value": "BC"},

"line": [{"value": "123 Any St"}],

"use": {"value": "home"},

"country": {"value": "CANADA"},

"city": {"value": "Anytown"}

},

"name": {

"given": [

{"value": "Frank"},

{"value": "I"}

],

"family": [{"value": "Seebetter"}],

"use": {"value": "official"}

},

"birthdate": {"value": "1952-06-26"}

},

"identifier": {

"system": {"value": "http://xyz.com/codes/identifier"},

"key": {"value": "AB9876"}

},

"subplan": {

"system": {"value": "http://xyz.com/codes/subplan"},

"key": {"value": "D15C9"}

}

}}

## 4.11: Examples: Device

Examples for the [Device (§3.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#device) resource.

#### 4.11.0.12: General

General Device Example

General Device Example (id = "example")

<Device xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**example**</p>

</div>

</text>

<type>

<coding>

<system value="http://snomed.info"/>

<code value="86184003"/>

<display value="Electrocardiographic monitor and recorder"/>

</coding>

<text value="ECG"/>

</type>

<manufacturer value="Acme Devices, Inc"/>

<model value="AB 45-J"/>

<identity>

<gtin value="04012313012313"/>

<lot value="43453424"/>

<serialNumber value="AMID-342135-8464"/>

<!-- no expiry for a ECG machine -->

</identity>

<assignedId>

<system value="http://goodcare.org/devices/id"/>

<key value="345675"/>

</assignedId>

<contact>

<system value="phone"/>

<value value="ext 4352"/>

</contact>

</Device>

JSON Equivalent

General Device Example

{"Device": {

"assignedId": [{

"system": {"value": "http://goodcare.org/devices/id"},

"key": {"value": "345675"}

}],

"identity": {

"gtin": {"value": "04012313012313"},

"serialNumber": {"value": "AMID-342135-8464"},

"lot": {"value": "43453424"}

},

"model": {"value": "AB 45-J"},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>example<\/p>\n <\/div>"

},

"manufacturer": {"value": "Acme Devices, Inc"},

"type": {

"text": {"value": "ECG"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Electrocardiographic monitor and recorder"},

"code": {"value": "86184003"}

}]

},

"contact": [{

"system": {"value": "phone"},

"value": {"value": "ext 4352"}

}]

}}

## 4.12: Examples: DeviceCapabilities

Examples for the [DeviceCapabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities) resource.

#### 4.12.0.13: General

Example of devicecapabilities

Example of devicecapabilities (id = "example")

<DeviceCapabilities xmlns="http://hl7.org/fhir">

<!--

This resource is derived from the same example used for DeviceObservation

It describes a relatively simple device that has the following properties:

\* one compartment (VMD)

\* one channel

\* nine metrics

\* no facets

The device does not know its own identity (this resource is hard coded at design time

-->

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**example**</p>

</div>

</text>

<name value="Patient Monitor"/>

<type>

<!-- todo: code this -->

<text value="Vital Signs Monitor"/>

</type>

<manufacturer value="Acme Devices, Inc"/>

<virtualDevice>

<channel>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="147842"/>

<display value="MDC\_ECG\_HEART\_RATE"/>

</coding>

</code>

<key value="M1"/>

<info>

<type value="Quantity"/>

<units value="/min"/>

<ucum value="/min"/>

</info>

</metric>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="148065"/>

<display value="MDC\_ECG\_V\_P\_C\_CNT"/>

</coding>

</code>

<key value="M2"/>

<info>

<type value="Quantity"/>

<units value="/min"/>

<ucum value="/min"/>

</info>

</metric>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="147842"/>

<display value="MDC\_ECG\_HEART\_RATE"/>

</coding>

</code>

<key value="M3"/>

<info>

<type value="Quantity"/>

<units value="/min"/>

<ucum value="/min"/>

</info>

</metric>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150033"/>

<display value="MDC\_PRESS\_BLD\_ART\_SYS"/>

</coding>

</code>

<key value="M4"/>

<info>

<type value="Quantity"/>

<units value="mmHg"/>

<ucum value="mm[Hg]"/>

</info>

</metric>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150034"/>

<display value="MDC\_PRESS\_BLD\_ART\_DIA"/>

</coding>

</code>

<key value="M5"/>

<info>

<type value="Quantity"/>

<units value="mmHg"/>

<ucum value="mm[Hg]"/>

</info>

</metric>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="149522"/>

<display value="MDC\_BLD\_PULS\_RATE\_INV"/>

</coding>

</code>

<key value="M6"/>

<info>

<type value="Quantity"/>

<units value="/min"/>

<ucum value="/min"/>

</info>

</metric>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150047"/>

<display value="MDC\_PRESS\_BLD\_ART\_PULM\_MEAN"/>

</coding>

</code>

<key value="M7"/>

<info>

<type value="Quantity"/>

<units value="mmHg"/>

<ucum value="mm[Hg]"/>

</info>

</metric>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150045"/>

<display value="MDC\_PRESS\_BLD\_ART\_PULM\_SYS"/>

</coding>

</code>

<key value="M8"/>

<info>

<type value="Quantity"/>

<units value="mmHg"/>

<ucum value="mm[Hg]"/>

</info>

</metric>

<metric>

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150046"/>

<display value="MDC\_PRESS\_BLD\_ART\_PULM\_DIA"/>

</coding>

</code>

<key value="M9"/>

<info>

<type value="Quantity"/>

<units value="mmHg"/>

<ucum value="mm[Hg]"/>

</info>

</metric>

</channel>

</virtualDevice>

</DeviceCapabilities>

JSON Equivalent

Example of devicecapabilities

{"DeviceCapabilities": {

"virtualDevice": [{"channel": [{"metric": [

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_ECG\_HEART\_RATE"},

"code": {"value": "147842"}

}]},

"key": {"value": "M1"},

"info": {

"ucum": {"value": "/min"},

"type": {"value": "Quantity"},

"units": {"value": "/min"}

}

},

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_ECG\_V\_P\_C\_CNT"},

"code": {"value": "148065"}

}]},

"key": {"value": "M2"},

"info": {

"ucum": {"value": "/min"},

"type": {"value": "Quantity"},

"units": {"value": "/min"}

}

},

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_ECG\_HEART\_RATE"},

"code": {"value": "147842"}

}]},

"key": {"value": "M3"},

"info": {

"ucum": {"value": "/min"},

"type": {"value": "Quantity"},

"units": {"value": "/min"}

}

},

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_SYS"},

"code": {"value": "150033"}

}]},

"key": {"value": "M4"},

"info": {

"ucum": {"value": "mm[Hg]"},

"type": {"value": "Quantity"},

"units": {"value": "mmHg"}

}

},

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_DIA"},

"code": {"value": "150034"}

}]},

"key": {"value": "M5"},

"info": {

"ucum": {"value": "mm[Hg]"},

"type": {"value": "Quantity"},

"units": {"value": "mmHg"}

}

},

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_BLD\_PULS\_RATE\_INV"},

"code": {"value": "149522"}

}]},

"key": {"value": "M6"},

"info": {

"ucum": {"value": "/min"},

"type": {"value": "Quantity"},

"units": {"value": "/min"}

}

},

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_PULM\_MEAN"},

"code": {"value": "150047"}

}]},

"key": {"value": "M7"},

"info": {

"ucum": {"value": "mm[Hg]"},

"type": {"value": "Quantity"},

"units": {"value": "mmHg"}

}

},

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_PULM\_SYS"},

"code": {"value": "150045"}

}]},

"key": {"value": "M8"},

"info": {

"ucum": {"value": "mm[Hg]"},

"type": {"value": "Quantity"},

"units": {"value": "mmHg"}

}

},

{

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_PULM\_DIA"},

"code": {"value": "150046"}

}]},

"key": {"value": "M9"},

"info": {

"ucum": {"value": "mm[Hg]"},

"type": {"value": "Quantity"},

"units": {"value": "mmHg"}

}

}

]}]}],

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>example<\/p>\n <\/div>"

},

"manufacturer": {"value": "Acme Devices, Inc"},

"name": {"value": "Patient Monitor"},

"type": {"text": {"value": "Vital Signs Monitor"}}

}}

## 4.13: Examples: DeviceLog

Examples for the [DeviceLog (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) resource.

#### 4.13.0.14: General

Example of devicelog

Example of devicelog (id = "example")

<DeviceLog xmlns="http://hl7.org/fhir">

<!--

This resource is derived from the same example used for DeviceObservation

It comes from a relatively simple device as described in the basic Device Capabilities example

This device has the id of the patient entered into its control panel, though it has no knowledge of the context of that value

-->

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**example**</p>

</div>

</text>

<contained>

<Patient id="patient">

<identifier>

<key value="AB60001"/>

</identifier>

</Patient>

</contained>

<instant value="2013-04-08T06:58:43-10:00"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="#patient"/>

</subject>

<item>

<key value="M1"/>

<value value="60"/>

</item>

<item>

<key value="M2"/>

<value value="0"/>

</item>

<item>

<key value="M3"/>

<value value="60"/>

</item>

<item>

<key value="M4"/>

<value value="120"/>

</item>

<item>

<key value="M5"/>

<value value="80"/>

</item>

<item>

<key value="M6"/>

<value value="60"/>

</item>

<item>

<key value="M7"/>

<value value="14"/>

</item>

<item>

<key value="M8"/>

<value value="25"/>

</item>

<item>

<key value="M9"/>

<value value="10"/>

</item>

</DeviceLog>

JSON Equivalent

Example of devicelog

{"DeviceLog": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>example<\/p>\n <\/div>"

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "#patient"}

},

"item": [

{

"value": {"value": "60"},

"key": {"value": "M1"}

},

{

"value": {"value": "0"},

"key": {"value": "M2"}

},

{

"value": {"value": "60"},

"key": {"value": "M3"}

},

{

"value": {"value": "120"},

"key": {"value": "M4"}

},

{

"value": {"value": "80"},

"key": {"value": "M5"}

},

{

"value": {"value": "60"},

"key": {"value": "M6"}

},

{

"value": {"value": "14"},

"key": {"value": "M7"}

},

{

"value": {"value": "25"},

"key": {"value": "M8"}

},

{

"value": {"value": "10"},

"key": {"value": "M9"}

}

],

"contained": [{"Patient": {

"\_id": "patient",

"identifier": [{"key": {"value": "AB60001"}}]

}}],

"instant": {"value": "2013-04-08T06:58:43-10:00"}

}}

## 4.14: Examples: DeviceObservation

Examples for the [DeviceObservation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation) resource.

#### 4.14.0.15: lab data

Lab data

Lab data (id = "lab")

<DeviceObservation xmlns="http://hl7.org/fhir">

<!--

The device observation examples are based on the example from http://ihe.net/Technical\_Framework/upload/IHE\_PCD\_TF\_Vol2.pdf:

MSH|^~\&amp;amp;|HL7^080019FFFF4F6AC0^EUI-64|MMS|||20081211144500||ORU^R01^ORU\_R01|12d15a9:11df9e61347:7fee:30456965|P|2.6|20081211144500||NE|AL||8859/1|||IHE PCD ORU-R01 2006^HL7^Universal ID^HL7

PID|||AB60001^^^A^PI||BROOKS^ALBERT^^^^^L

PV1||E|3 WEST ICU^3001^1

OBR|1|080019FFFF4F6AFE20081211144657^AwareGateway^080019FFFF4F6AC0^EUI-64|080019FFFF4F6AC020081211144657^AwareGateway^080019FFFF4F6AC0^EUI-64|126.169.95.2^2000^MDC|||20081211144500

OBX|1|NM|147842^MDC\_ECG\_HEART\_RATE^MDC|1.6.1.1|60|/min^/min^UCUM|||||R|||||||||

OBX|2|NM|148065^MDC\_ECG\_V\_P\_C\_CNT^MDC|1.6.1.2|0|/min^/min^UCUM|||||R|||||||||

OBX|3|NM|150035^MDC\_PRESS\_BLD\_ART\_MEAN^MDC|1.3.1.1|92|mm[Hg]^mm[Hg]^UCUM|||||R|||||||||

OBX|4|NM|150033^MDC\_PRESS\_BLD\_ART\_SYS^MDC|1.3.1.2|120|mm[Hg]^mm[Hg]^UCUM|||||R|||||||||

OBX|5|NM|150034^MDC\_PRESS\_BLD\_ART\_DIA^MDC|1.3.1.3|80|mm[Hg]^mm[Hg]^UCUM|||||R|||||||||

OBX|6|NM|149522^MDC\_BLD\_PULS\_RATE\_INV^MDC|1.2.1.1|60|/min^/min^UCUM|||||R|||||||||

OBX|7|NM|150047^MDC\_PRESS\_BLD\_ART\_PULM\_MEAN^MDC|1.4.2.1|14|mm[Hg]^mm[Hg]^UCUM|||||R|||||||||

OBX|8|NM|150045^MDC\_PRESS\_BLD\_ART\_PULM\_SYS^MDC|1.4.2.2|25|mm[Hg]^mm[Hg]^UCUM|||||R|||||||||

OBX|9|NM|150046^MDC\_PRESS\_BLD\_ART\_PULM\_DIA^MDC|1.4.2.3|10|mm[Hg]^mm[Hg]^UCUM|||||R|||||||||

-->

<!--

For the purposes of this example - principally to have a single file that includes the important

parts - the observations are contained within the Device Observation report.

In production usage, putting the granular observations inside the device observation resource

means that the individual observations don't have an identity. Systems that wish to extract

and use these granular observations have to re-identify them. The Condition for these systems

is that this must be done consistently, else there'll be cloned observations, and the users

will get confused by spurious copies of the data.

Systems that need to re-identify the granular observations could do so using the

Observation.identity element - \*if\* it's populated completely and correctly. But

must easier to properly identify the observations first rather than making them

contained ones (even though this is easier for the sender)

-->

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**[Put rendering here]**</div>

</text>

<contained>

<!-- OBX|1|NM|147842^MDC\_ECG\_HEART\_RATE^MDC|1.6.1.1|60|/min^/min^UCUM|||||R||||||||| -->

<Observation id="o1">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="147842"/>

<display value="MDC\_ECG\_HEART\_RATE"/>

</coding>

</name>

<valueQuantity>

<value value="60"/>

<units value="/min"/>

<system value="http://unitsofmeasure.org"/>

<code value="/min"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<!-- OBX|2|NM|148065^MDC\_ECG\_V\_P\_C\_CNT^MDC|1.6.1.2|0|/min^/min^UCUM|||||R||||||||| -->

<Observation id="o2">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="148065"/>

<display value="MDC\_ECG\_V\_P\_C\_CNT"/>

</coding>

</name>

<valueQuantity>

<value value="0"/>

<units value="/min"/>

<system value="http://unitsofmeasure.org"/>

<code value="/min"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<!-- OBX|3|NM|150035^MDC\_PRESS\_BLD\_ART\_MEAN^MDC|1.3.1.1|92|mm[Hg]^mm[Hg]^UCUM|||||R||||||||| -->

<Observation id="o3">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="147842"/>

<display value="MDC\_ECG\_HEART\_RATE"/>

</coding>

</name>

<valueQuantity>

<value value="60"/>

<units value="/min"/>

<system value="http://unitsofmeasure.org"/>

<code value="/min"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<!-- OBX|4|NM|150033^MDC\_PRESS\_BLD\_ART\_SYS^MDC|1.3.1.2|120|mm[Hg]^mm[Hg]^UCUM|||||R||||||||| -->

<Observation id="o4">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150033"/>

<display value="MDC\_PRESS\_BLD\_ART\_SYS"/>

</coding>

</name>

<valueQuantity>

<value value="120"/>

<units value="mmHg"/>

<system value="http://unitsofmeasure.org"/>

<code value="mm[Hg]"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<!-- OBX|5|NM|150034^MDC\_PRESS\_BLD\_ART\_DIA^MDC|1.3.1.3|80|mm[Hg]^mm[Hg]^UCUM|||||R||||||||| -->

<Observation id="o5">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150034"/>

<display value="MDC\_PRESS\_BLD\_ART\_DIA"/>

</coding>

</name>

<valueQuantity>

<value value="80"/>

<units value="mmHg"/>

<system value="http://unitsofmeasure.org"/>

<code value="mm[Hg]"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<!-- OBX|6|NM|149522^MDC\_BLD\_PULS\_RATE\_INV^MDC|1.2.1.1|60|/min^/min^UCUM|||||R||||||||| -->

<Observation id="o6">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="149522"/>

<display value="MDC\_BLD\_PULS\_RATE\_INV"/>

</coding>

</name>

<valueQuantity>

<value value="60"/>

<units value="/min"/>

<system value="http://unitsofmeasure.org"/>

<code value="/min"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<!-- OBX|7|NM|150047^MDC\_PRESS\_BLD\_ART\_PULM\_MEAN^MDC|1.4.2.1|14|mm[Hg]^mm[Hg]^UCUM|||||R||||||||| -->

<Observation id="o7">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150047"/>

<display value="MDC\_PRESS\_BLD\_ART\_PULM\_MEAN"/>

</coding>

</name>

<valueQuantity>

<value value="14"/>

<units value="mmHg"/>

<system value="http://unitsofmeasure.org"/>

<code value="mm[Hg]"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<!-- OBX|8|NM|150045^MDC\_PRESS\_BLD\_ART\_PULM\_SYS^MDC|1.4.2.2|25|mm[Hg]^mm[Hg]^UCUM|||||R||||||||| -->

<Observation id="o8">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150045"/>

<display value="MDC\_PRESS\_BLD\_ART\_PULM\_SYS"/>

</coding>

</name>

<valueQuantity>

<value value="25"/>

<units value="mmHg"/>

<system value="http://unitsofmeasure.org"/>

<code value="mm[Hg]"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<!-- OBX|9|NM|150046^MDC\_PRESS\_BLD\_ART\_PULM\_DIA^MDC|1.4.2.3|10|mm[Hg]^mm[Hg]^UCUM|||||R||||||||| -->

<Observation id="o9">

<name>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="150046"/>

<display value="MDC\_PRESS\_BLD\_ART\_PULM\_DIA"/>

</coding>

</name>

<valueQuantity>

<value value="10"/>

<units value="mmHg"/>

<system value="http://unitsofmeasure.org"/>

<code value="mm[Hg]"/>

</valueQuantity>

<status value="interim"/>

<reliability value="ok"/>

</Observation>

</contained>

<!-- OBR|1|080019FFFF4F6AFE20081211144657^AwareGateway^080019FFFF4F6AC0^EUI-64|080019FFFF4F6AC020081211144657^AwareGateway^080019FFFF4F6AC0^EUI-64|126.169.95.2^2000^MDC|||20081211144500

-->

<code>

<coding>

<system value="urn:std:iso:11073:10101"/><!-- mdc -->

<code value="126.169.95.2"/>

<display value="2000"/><!-- weird, but that's what the IHE message has -->

</coding>

</code>

<identifier>

<!-- this is probably the right way to interpret OBR-2? -->

<system value="http://acme.org/examples/AwareGateway/080019FFFF4F6AC0"/>

<key value="080019FFFF4F6AFE20081211144657"/>

</identifier>

<issued value="2008-12-11T14:45:00"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@ihe-pcd](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-ihe-pcd)"/>

</subject>

<device>

<type value="[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device)"/>

<reference value="[device/@ihe-pcd](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-example-ihe-pcd)"/>

</device>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o1"/>

</measurement>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o2"/>

</measurement>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o3"/>

</measurement>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o4"/>

</measurement>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o5"/>

</measurement>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o6"/>

</measurement>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o7"/>

</measurement>

</DeviceObservation>

JSON Equivalent

Lab data

{"DeviceObservation": {

"text": {

"status": {"value": "generated"},

"div": "<div>[Put rendering here]<\/div>"

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@ihe-pcd"}

},

"issued": {"value": "2008-12-11T14:45:00+11:00"},

"device": {

"type": {"value": "Device"},

"reference": {"value": "device/@ihe-pcd"}

},

"contained": [

{"Observation": {

"\_id": "o1",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_ECG\_HEART\_RATE"},

"code": {"value": "147842"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "60"},

"code": {"value": "/min"},

"units": {"value": "/min"}

}

}},

{"Observation": {

"\_id": "o2",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_ECG\_V\_P\_C\_CNT"},

"code": {"value": "148065"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0"},

"code": {"value": "/min"},

"units": {"value": "/min"}

}

}},

{"Observation": {

"\_id": "o3",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_ECG\_HEART\_RATE"},

"code": {"value": "147842"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "60"},

"code": {"value": "/min"},

"units": {"value": "/min"}

}

}},

{"Observation": {

"\_id": "o4",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_SYS"},

"code": {"value": "150033"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "120"},

"code": {"value": "mm[Hg]"},

"units": {"value": "mmHg"}

}

}},

{"Observation": {

"\_id": "o5",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_DIA"},

"code": {"value": "150034"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "80"},

"code": {"value": "mm[Hg]"},

"units": {"value": "mmHg"}

}

}},

{"Observation": {

"\_id": "o6",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_BLD\_PULS\_RATE\_INV"},

"code": {"value": "149522"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "60"},

"code": {"value": "/min"},

"units": {"value": "/min"}

}

}},

{"Observation": {

"\_id": "o7",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_PULM\_MEAN"},

"code": {"value": "150047"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "14"},

"code": {"value": "mm[Hg]"},

"units": {"value": "mmHg"}

}

}},

{"Observation": {

"\_id": "o8",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_PULM\_SYS"},

"code": {"value": "150045"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "25"},

"code": {"value": "mm[Hg]"},

"units": {"value": "mmHg"}

}

}},

{"Observation": {

"\_id": "o9",

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "MDC\_PRESS\_BLD\_ART\_PULM\_DIA"},

"code": {"value": "150046"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "10"},

"code": {"value": "mm[Hg]"},

"units": {"value": "mmHg"}

}

}}

],

"code": {"coding": [{

"system": {"value": "urn:std:iso:11073:10101"},

"display": {"value": "2000"},

"code": {"value": "126.169.95.2"}

}]},

"identifier": [{

"system": {"value": "http://acme.org/examples/AwareGateway/080019FFFF4F6AC0"},

"key": {"value": "080019FFFF4F6AFE20081211144657"}

}],

"measurement": [

{

"type": {"value": "Observation"},

"reference": {"value": "#o1"}

},

{

"type": {"value": "Observation"},

"reference": {"value": "#o2"}

},

{

"type": {"value": "Observation"},

"reference": {"value": "#o3"}

},

{

"type": {"value": "Observation"},

"reference": {"value": "#o4"}

},

{

"type": {"value": "Observation"},

"reference": {"value": "#o5"}

},

{

"type": {"value": "Observation"},

"reference": {"value": "#o6"}

},

{

"type": {"value": "Observation"},

"reference": {"value": "#o7"}

}

]

}}

#### 4.14.0.16: glucose

Query for glucose information

Query for glucose information (id = "example")

<feed xmlns="http://www.w3.org/2005/Atom">

<title>**Glucose Query Result**</title>

<id>**urn:uuid:500bee81-d973-4afe-b592-d39fe71e38**</id>

<link href="urn:guid:180f219f-97a8-486d-99d9-ed631fe4fc52" rel="self"/>

<updated>**2013-05-28T22:12:21Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<!-- The first result -->

<entry>

<title>**Glucose Result**</title>

<id>**urn:guid:180f219f-97a8-486d-99d9-ed631fe4fc58**</id>

<updated>**2013-05-28T22:12:21Z**</updated>

<content type="text/xml">

<DeviceObservation xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Glucose 5.5 mmol/l**</div>

</text>

<contained>

<Observation id="o1">

<name>

<coding>

<system value="http://snomed.info"/><!-- snomed -->

<code value="308113006"/>

<display value="Self Monitoring Blood glucose"/>

</coding>

</name>

<status value="interim"/>

<reliability value="ok"/>

<component>

<name>

<coding>

<system value="http://snomed.info"/><!-- snomed -->

<code value="308113006"/>

<display value="Self Monitoring Blood glucose"/>

</coding>

</name>

<valueQuantity>

<value value="5.5"/>

<units value="mmol/L"/>

</valueQuantity>

</component>

</Observation>

</contained>

<code>

<coding>

<system value="or"/>

<code value="glu"/>

</coding>

</code>

<issued value="2008-12-11T14:45:00"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@ihe-pcd](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-ihe-pcd)"/>

</subject>

<device>

<type value="[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device)"/>

<reference value="[device/@ihe-pcd](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-example-ihe-pcd)"/>

</device>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o1"/>

</measurement>

</DeviceObservation>

</content>

</entry>

<!-- The second result -->

<entry>

<title>**Glucose Result**</title>

<id>**urn:guid:f539c23c-23a6-4fdc-b73f-898fbccce074**</id>

<updated>**2013-05-28T22:12:21Z**</updated>

<content type="text/xml">

<DeviceObservation xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Glucose 5.6 mmol/l**</div>

</text>

<contained>

<Observation id="o2">

<name>

<coding>

<system value="http://snomed.info"/><!-- snomed -->

<code value="308113006"/>

<display value="Self Monitoring Blood glucose"/>

</coding>

</name>

<status value="interim"/>

<reliability value="ok"/>

<component>

<name>

<coding>

<system value="http://snomed.info"/><!-- snomed -->

<code value="308113006"/>

<display value="Self Monitoring Blood glucose"/>

</coding>

</name>

<valueQuantity>

<value value="5.6"/>

<units value="mmol/L"/>

</valueQuantity>

</component>

</Observation>

</contained>

<code>

<coding>

<system value="or"/>

<code value="glu"/>

</coding>

</code>

<issued value="2008-12-11T15:45:00"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@ihe-pcd](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-ihe-pcd)"/>

</subject>

<device>

<type value="[Device](http://hl7.org/implement/standards/fhir/fhir-book.htm#device)"/>

<reference value="[device/@ihe-pcd](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-example-ihe-pcd)"/>

</device>

<measurement>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#o2"/>

</measurement>

</DeviceObservation>

</content>

</entry>

</feed>

JSON Equivalent

Query for glucose information

{

"id": "urn:uuid:500bee81-d973-4afe-b592-d39fe71e38",

"authors": [{"name": "Dr Dave"}],

"title": "Glucose Query Result",

"updated": "2013-05-28T22:12:21Z",

"entries": [

{

"content": {"DeviceObservation": {

"text": {

"status": {"value": "generated"},

"div": "<div>Glucose 5.5 mmol/l<\/div>"

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@ihe-pcd"}

},

"issued": {"value": "2008-12-11T14:45:00+11:00"},

"device": {

"type": {"value": "Device"},

"reference": {"value": "device/@ihe-pcd"}

},

"contained": [{"Observation": {

"\_id": "o1",

"component": [{

"name": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Self Monitoring Blood glucose"},

"code": {"value": "308113006"}

}]},

"valueQuantity": {

"value": {"value": "5.5"},

"units": {"value": "mmol/L"}

}

}],

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Self Monitoring Blood glucose"},

"code": {"value": "308113006"}

}]},

"reliability": {"value": "ok"}

}}],

"code": {"coding": [{

"system": {"value": "or"},

"code": {"value": "glu"}

}]},

"measurement": [{

"type": {"value": "Observation"},

"reference": {"value": "#o1"}

}]

}},

"id": "urn:guid:180f219f-97a8-486d-99d9-ed631fe4fc58",

"title": "Glucose Result",

"updated": "2013-05-28T22:12:21Z"

},

{

"content": {"DeviceObservation": {

"text": {

"status": {"value": "generated"},

"div": "<div>Glucose 5.6 mmol/l<\/div>"

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@ihe-pcd"}

},

"issued": {"value": "2008-12-11T15:45:00+11:00"},

"device": {

"type": {"value": "Device"},

"reference": {"value": "device/@ihe-pcd"}

},

"contained": [{"Observation": {

"\_id": "o2",

"component": [{

"name": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Self Monitoring Blood glucose"},

"code": {"value": "308113006"}

}]},

"valueQuantity": {

"value": {"value": "5.6"},

"units": {"value": "mmol/L"}

}

}],

"status": {"value": "interim"},

"name": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Self Monitoring Blood glucose"},

"code": {"value": "308113006"}

}]},

"reliability": {"value": "ok"}

}}],

"code": {"coding": [{

"system": {"value": "or"},

"code": {"value": "glu"}

}]},

"measurement": [{

"type": {"value": "Observation"},

"reference": {"value": "#o2"}

}]

}},

"id": "urn:guid:f539c23c-23a6-4fdc-b73f-898fbccce074",

"title": "Glucose Result",

"updated": "2013-05-28T22:12:21Z"

}

],

"links": [{

"rel": "self",

"href": "urn:guid:180f219f-97a8-486d-99d9-ed631fe4fc52"

}]

}

## 4.15: Examples: DiagnosticOrder

Examples for the [DiagnosticOrder (§3.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder) resource.

#### 4.15.0.17: General

Example of diagnosticorder

Example of diagnosticorder (id = "example")

<DiagnosticOrder xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

**Example Diagnostic Order**

</div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="patient/@1"/>

</subject>

<orderer>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</orderer>

<identifier>

<label value="Placer"/>

<system value="urn:oid:1.3.4.5.6.7"/>

<key value="2345234234234"/>

</identifier>

<status value="received"/>

<event>

<status value="requested"/>

<date value="2013-05-02T16:16:00"/>

</event>

<item>

<code>

<coding>

<system value="http://acme.org/tests"/>

<code value="LIPID"/>

</coding>

<text value="Lipid Panel"/>

</code>

</item>

</DiagnosticOrder>

JSON Equivalent

Example of diagnosticorder

{"DiagnosticOrder": {

"orderer": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"text": {

"status": {"value": "generated"},

"div": "<div> \n Example Diagnostic Order\n <\/div>"

},

"status": {"value": "received"},

"event": [{

"status": {"value": "requested"},

"date": {"value": "2013-05-02T16:16:00"}

}],

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@1"}

},

"item": [{"code": {

"text": {"value": "Lipid Panel"},

"coding": [{

"system": {"value": "http://acme.org/tests"},

"code": {"value": "LIPID"}

}]

}}],

"identifier": [{

"system": {"value": "urn:oid:1.3.4.5.6.7"},

"label": {"value": "Placer"},

"key": {"value": "2345234234234"}

}]

}}

## 4.16: Examples: DiagnosticReport

Examples for the [DiagnosticReport (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport) resource.

#### 4.16.0.18: General

General Lab Report Example

General Lab Report Example (id = "101")

<DiagnosticReport xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<h3>**CBC Report for Wile. E. COYOTE (MRN: 23453) issued 3-Mar 2011 11:45**</h3>

<!-- you could use an html table here, but laboratories are still

using fixed text tables, and this will take decades to change... -->

<pre>

**Test Units Value Reference Range**

**Haemoglobin g/L 176 135 - 180**

**Red Cell Count x10\*12/L 5.9 4.2 - 6.0**

**Haematocrit 0.55+ 0.38 - 0.52**

**Mean Cell Volume fL 99+ 80 - 98**

**Mean Cell Haemoglobin pg 36+ 27 - 35**

**Platelet Count x10\*9/L 444 150 - 450**

**White Cell Count x10\*9/L 4.6 4.0 - 11.0**

**Neutrophils % 20**

**Neutrophils x10\*9/L 0.9--- 2.0 - 7.5**

**Lymphocytes % 20**

**Lymphocytes x10\*9/L 0.9- 1.1 - 4.0**

**Monocytes % 20**

**Monocytes x10\*9/L 0.9 0.2 - 1.0**

**Eosinophils % 20**

**Eosinophils x10\*9/L 0.92++ 0.04 - 0.40**

**Basophils % 20**

**Basophils x10\*9/L 0.92+++ &lt;0.21**

</pre>

<p>**Acme Laboratory, Inc signed: Dr Pete Pathologist**</p>

</div>

</text>

<contained>

<!--

all the data items (= Observations) are contained

in this diagnostic report. It would be equally

valid - and normal - for them to be separate trackable

items. However for the purposes of this example, it's

more convenient to have them here. For more discussion,

see under &quot;Contained Resources&quot; on the Resource Definitions

topic page -->

<!-- for users steeped in v2, each observation roughly corresponds with an

OBX, and the Diagnostic Report with an ORU\_R01 message -->

<Observation id="r1">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="718-7"/>

<display value="Haemoglobin"/>

</coding>

</name>

<valueQuantity>

<value value="176"/>

<units value="g/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="g/L"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="135"/>

<units value="g/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="g/L"/>

</low>

<high>

<value value="180"/>

<units value="g/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="g/L"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r2">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="789-8"/>

<display value="Red Cell Count"/>

</coding>

</name>

<valueQuantity>

<value value="5.9"/>

<units value="x10\*12/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*12/L"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="4.2"/>

<units value="x10\*12/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*12/L"/>

</low>

<high>

<value value="6.0"/>

<units value="x10\*12/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*12/L"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r3">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="4544-3"/>

<display value="Haematocrit"/>

</coding>

</name>

<valueQuantity>

<value value="55"/>

<units value="%"/>

</valueQuantity>

<interpretation>

<coding>

<system value="http://hl7.org/fhir/v2/0078"/>

<code value="H"/>

</coding>

</interpretation>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="38"/>

<units value="%"/>

</low>

<high>

<value value="52"/>

<units value="%"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r4">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="787-2"/>

<display value="Mean Cell Volume"/>

</coding>

</name>

<valueQuantity>

<value value="99"/>

<units value="fL"/>

<system value="http://unitsofmeasure.org"/>

<code value="fL"/>

</valueQuantity>

<interpretation>

<coding>

<system value="http://hl7.org/fhir/v2/0078"/>

<code value="H"/>

</coding>

</interpretation>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="80"/>

<units value="fL"/>

<system value="http://unitsofmeasure.org"/>

<code value="fL"/>

</low>

<high>

<value value="98"/>

<units value="fL"/>

<system value="http://unitsofmeasure.org"/>

<code value="fL"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r5">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="785-6"/>

<display value="Mean Cell Haemoglobin"/>

</coding>

</name>

<valueQuantity>

<value value="36"/>

<units value="pg"/>

<system value="http://unitsofmeasure.org"/>

<code value="pg"/>

</valueQuantity>

<interpretation>

<coding>

<system value="http://hl7.org/fhir/v2/0078"/>

<code value="H"/>

</coding>

</interpretation>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="27"/>

<units value="pg"/>

<system value="http://unitsofmeasure.org"/>

<code value="pg"/>

</low>

<high>

<value value="35"/>

<units value="pg"/>

<system value="http://unitsofmeasure.org"/>

<code value="pg"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r6">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="777-3"/>

<display value="Platelet Count"/>

</coding>

</name>

<valueQuantity>

<value value="444"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="150"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</low>

<high>

<value value="450"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r7">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="6690-2"/>

<display value="White Cell Count"/>

</coding>

</name>

<valueQuantity>

<value value="4.6"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="4.0"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</low>

<high>

<value value="11.0"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r8">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="770-8"/>

<display value="Neutrophils"/>

</coding>

</name>

<valueQuantity>

<value value="20"/>

<units value="%"/>

<system value="http://unitsofmeasure.org"/>

<code value="%"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<Observation id="r9">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="751-8"/>

<display value="Neutrophils"/>

</coding>

</name>

<valueQuantity>

<value value="0.9"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</valueQuantity>

<interpretation>

<coding>

<system value="http://hl7.org/fhir/v2/0078"/>

<code value="LL"/>

</coding>

</interpretation>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="2.0"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</low>

<high>

<value value="7.5"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r10">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="736-9"/>

<display value="Lymphocytes"/>

</coding>

</name>

<valueQuantity>

<value value="20"/>

<units value="%"/>

<system value="http://unitsofmeasure.org"/>

<code value="%"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<Observation id="r11">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="731-0"/>

<display value="Lymphocytes"/>

</coding>

</name>

<valueQuantity>

<value value="0.9"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</valueQuantity>

<interpretation>

<coding>

<system value="http://hl7.org/fhir/v2/0078"/>

<code value="L"/>

</coding>

</interpretation>

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<reliability value="ok"/>

<referenceRange>

<rangeRange>

<low>

<value value="1.1"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</low>

<high>

<value value="4.0"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r12">

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<status value="empty"/>

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</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="5905-5"/>

<display value="Monocytes"/>

</coding>

</name>

<valueQuantity>

<value value="20"/>

<units value="%"/>

<system value="http://unitsofmeasure.org"/>

<code value="%"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<Observation id="r13">

<text>

<status value="empty"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Missing**</div>

</text>

<name>

<coding>

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<code value="742-7"/>

<display value="Monocytes"/>

</coding>

</name>

<valueQuantity>

<value value="0.9"/>

<units value="x10\*9/L"/>

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<code value="10\*9/L"/>

</valueQuantity>

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<referenceRange>

<rangeRange>

<low>

<value value="0.2"/>

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<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</low>

<high>

<value value="1.0"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

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<status value="empty"/>

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</text>

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<coding>

<system value="http://loinc.org"/>

<code value="713-8"/>

<display value="Eosinophils"/>

</coding>

</name>

<valueQuantity>

<value value="20"/>

<units value="%"/>

<system value="http://unitsofmeasure.org"/>

<code value="%"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<Observation id="r15">

<text>

<status value="empty"/>

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</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="711-2"/>

<display value="Eosinophils"/>

</coding>

</name>

<valueQuantity>

<value value="0.92"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</valueQuantity>

<interpretation>

<coding>

<system value="http://hl7.org/fhir/v2/0078"/>

<code value="HH"/>

</coding>

</interpretation>

<status value="final"/>

<reliability value="ok"/>

<referenceRange>

<rangeRange>

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<value value="0.04"/>

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<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</low>

<high>

<value value="0.40"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</high>

</rangeRange>

</referenceRange>

</Observation>

</contained>

<contained>

<Observation id="r16">

<text>

<status value="empty"/>

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</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="706-2"/>

<display value="Basophils"/>

</coding>

</name>

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<value value="20"/>

<units value="%"/>

<system value="http://unitsofmeasure.org"/>

<code value="%"/>

</valueQuantity>

<status value="final"/>

<reliability value="ok"/>

</Observation>

</contained>

<contained>

<Observation id="r17">

<text>

<status value="empty"/>

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</text>

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</coding>

</name>

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<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</valueQuantity>

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<referenceRange>

<rangeQuantity>

<value value="0.21"/>

<comparator value="&lt;"/>

<units value="x10\*9/L"/>

<system value="http://unitsofmeasure.org"/>

<code value="10\*9/L"/>

</rangeQuantity>

</referenceRange>

</Observation>

</contained>

<!-- first, various administrative/context stuff -->

<status value="final"/><!-- all this report is final -->

<issued value="2011-03-04T11:45:33+11:00"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@pat2](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-b)"/>

</subject>

<performer>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@1832473e-2fe0-452d-abe9-3cdb9879522f](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-lab)"/>

<display value="Acme Laboratory, Inc"/>

</performer>

<reportId>

<system value="http://acme.com/lab/reports"/>

<key value="5234342"/>

</reportId>

<serviceCategory>

<coding>

<system value="http://hl7.org/fhir/v2/0074"/>

<code value="HM"/>

</coding>

</serviceCategory>

<diagnosticTime value="2011-03-04T08:30:00+11:00"/>

<results>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="15430-2"/>

<display value="FULL BLOOD EXAMINATION"/>

</coding>

<coding>

<code value="CBC"/>

<display value="MASTER FULL BLOOD COUNT"/>

</coding>

</name>

<!-- now the atomic results -->

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r1"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r2"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r3"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r4"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r5"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r6"/>

</result>

<result>

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</result>

<result>

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</result>

<result>

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<reference value="#r9"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

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</result>

<result>

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</result>

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<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r12"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r13"/>

</result>

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<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

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<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r15"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r16"/>

</result>

<result>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="#r17"/>

</result>

</results>

<!-- finally, here's a pdf representation of the same report.

A consuming application could choose to display either the

html version above, or the pdf version - they both need to convey the

same information -->

<representation>

<contentType value="application/pdf"/>

<language value="en-AU"/>

<data value=""/>

<title value="HTML Report"/>

</representation>

</DiagnosticReport>

JSON Equivalent

General Lab Report Example

{"DiagnosticReport": {

"text": {

"status": {"value": "generated"},

"div": "<div> \n <h3>CBC Report for Wile. E. COYOTE (MRN: 23453) issued 3-Mar 2011 11:45<\/h3> \n\n <pre>\nTest Units Value Reference Range\nHaemoglobin g/L 176 135 - 180\nRed Cell Count x10\*12/L 5.9 4.2 - 6.0\nHaematocrit 0.55+ 0.38 - 0.52\nMean Cell Volume fL 99+ 80 - 98\nMean Cell Haemoglobin pg 36+ 27 - 35\nPlatelet Count x10\*9/L 444 150 - 450\nWhite Cell Count x10\*9/L 4.6 4.0 - 11.0\nNeutrophils % 20 \nNeutrophils x10\*9/L 0.9--- 2.0 - 7.5\nLymphocytes % 20 \nLymphocytes x10\*9/L 0.9- 1.1 - 4.0\nMonocytes % 20 \nMonocytes x10\*9/L 0.9 0.2 - 1.0\nEosinophils % 20 \nEosinophils x10\*9/L 0.92++ 0.04 - 0.40\nBasophils % 20 \nBasophils x10\*9/L 0.92+++ &lt;0.21\n <\/pre>\n <p>Acme Laboratory, Inc signed: Dr Pete Pathologist<\/p>\n <\/div>"

},

"results": {

"result": [

{

"type": {"value": "Observation"},

"reference": {"value": "#r1"}

},

{

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"reference": {"value": "#r2"}

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"type": {"value": "Observation"},

"reference": {"value": "#r3"}

},

{

"type": {"value": "Observation"},

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},

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"type": {"value": "Observation"},

"reference": {"value": "#r5"}

},

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"type": {"value": "Observation"},

"reference": {"value": "#r6"}

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{

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},

{

"type": {"value": "Observation"},

"reference": {"value": "#r17"}

}

],

"name": {"coding": [

{

"system": {"value": "http://loinc.org"},

"display": {"value": "FULL BLOOD EXAMINATION"},

"code": {"value": "15430-2"}

},

{

"display": {"value": "MASTER FULL BLOOD COUNT"},

"code": {"value": "CBC"}

}

]}

},

"status": {"value": "final"},

"representation": [{

"title": {"value": "HTML Report"},

"data": {"value": ""},

"language": {"value": "en-AU"},

"contentType": {"value": "application/pdf"}

}],

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@pat2"}

},

"issued": {"value": "2011-03-04T11:45:33+11:00"},

"performer": {

"display": {"value": "Acme Laboratory, Inc"},

"type": {"value": "Organization"},

"reference": {"value": "organization/@1832473e-2fe0-452d-abe9-3cdb9879522f"}

},

"contained": [

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"div": "<div>Missing<\/div>"

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"\_id": "r1",

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"display": {"value": "Haemoglobin"},

"code": {"value": "718-7"}

}]},

"reliability": {"value": "ok"},

"referenceRange": [{"rangeRange": {

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"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "180"},

"code": {"value": "g/L"},

"units": {"value": "g/L"}

},

"low": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "135"},

"code": {"value": "g/L"},

"units": {"value": "g/L"}

}

}}],

"valueQuantity": {

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"value": {"value": "176"},

"code": {"value": "g/L"},

"units": {"value": "g/L"}

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}},

{"Observation": {

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"display": {"value": "Red Cell Count"},

"code": {"value": "789-8"}

}]},

"reliability": {"value": "ok"},

"referenceRange": [{"rangeRange": {

"high": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "6.0"},

"code": {"value": "10\*12/L"},

"units": {"value": "x10\*12/L"}

},

"low": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "4.2"},

"code": {"value": "10\*12/L"},

"units": {"value": "x10\*12/L"}

}

}}],

"valueQuantity": {

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"value": {"value": "5.9"},

"code": {"value": "10\*12/L"},

"units": {"value": "x10\*12/L"}

}

}},

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"name": {"coding": [{

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"display": {"value": "Haematocrit"},

"code": {"value": "4544-3"}

}]},

"reliability": {"value": "ok"},

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},

"low": {

"value": {"value": "38"},

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}},

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"status": {"value": "final"},

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Mean Cell Volume"},

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}]},

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"referenceRange": [{"rangeRange": {

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"code": {"value": "fL"},

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},

"low": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "80"},

"code": {"value": "fL"},

"units": {"value": "fL"}

}

}}],

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}]},

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"code": {"value": "fL"},

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}

}},

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"status": {"value": "final"},

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"display": {"value": "Mean Cell Haemoglobin"},

"code": {"value": "785-6"}

}]},

"reliability": {"value": "ok"},

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"code": {"value": "pg"},

"units": {"value": "pg"}

},

"low": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "27"},

"code": {"value": "pg"},

"units": {"value": "pg"}

}

}}],

"interpretation": {"coding": [{

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"code": {"value": "pg"},

"units": {"value": "pg"}

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"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Platelet Count"},

"code": {"value": "777-3"}

}]},

"reliability": {"value": "ok"},

"referenceRange": [{"rangeRange": {

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"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "450"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

},

"low": {

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"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}}],

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}},

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}]},

"reliability": {"value": "ok"},

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"value": {"value": "11.0"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

},

"low": {

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"value": {"value": "4.0"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}}],

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"value": {"value": "4.6"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}},

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"name": {"coding": [{

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"display": {"value": "Neutrophils"},

"code": {"value": "770-8"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

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"value": {"value": "20"},

"code": {"value": "%"},

"units": {"value": "%"}

}

}},

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"code": {"value": "751-8"}

}]},

"reliability": {"value": "ok"},

"referenceRange": [{"rangeRange": {

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"value": {"value": "7.5"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

},

"low": {

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"value": {"value": "2.0"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}}],

"interpretation": {"coding": [{

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}]},

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"value": {"value": "0.9"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}},

{"Observation": {

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"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Lymphocytes"},

"code": {"value": "736-9"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "20"},

"code": {"value": "%"},

"units": {"value": "%"}

}

}},

{"Observation": {

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"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Lymphocytes"},

"code": {"value": "731-0"}

}]},

"reliability": {"value": "ok"},

"referenceRange": [{"rangeRange": {

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"value": {"value": "4.0"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

},

"low": {

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"value": {"value": "1.1"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}}],

"interpretation": {"coding": [{

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}]},

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"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0.9"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}},

{"Observation": {

"text": {

"status": {"value": "empty"},

"div": "<div>Missing<\/div>"

},

"\_id": "r12",

"status": {"value": "final"},

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Monocytes"},

"code": {"value": "5905-5"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "20"},

"code": {"value": "%"},

"units": {"value": "%"}

}

}},

{"Observation": {

"text": {

"status": {"value": "empty"},

"div": "<div>Missing<\/div>"

},

"\_id": "r13",

"status": {"value": "final"},

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Monocytes"},

"code": {"value": "742-7"}

}]},

"reliability": {"value": "ok"},

"referenceRange": [{"rangeRange": {

"high": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "1.0"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

},

"low": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0.2"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}}],

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0.9"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}},

{"Observation": {

"text": {

"status": {"value": "empty"},

"div": "<div>Missing<\/div>"

},

"\_id": "r14",

"status": {"value": "final"},

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Eosinophils"},

"code": {"value": "713-8"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "20"},

"code": {"value": "%"},

"units": {"value": "%"}

}

}},

{"Observation": {

"text": {

"status": {"value": "empty"},

"div": "<div>Missing<\/div>"

},

"\_id": "r15",

"status": {"value": "final"},

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Eosinophils"},

"code": {"value": "711-2"}

}]},

"reliability": {"value": "ok"},

"referenceRange": [{"rangeRange": {

"high": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0.40"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

},

"low": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0.04"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}}],

"interpretation": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v2/0078"},

"code": {"value": "HH"}

}]},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0.92"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}},

{"Observation": {

"text": {

"status": {"value": "empty"},

"div": "<div>Missing<\/div>"

},

"\_id": "r16",

"status": {"value": "final"},

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Basophils"},

"code": {"value": "706-2"}

}]},

"reliability": {"value": "ok"},

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "20"},

"code": {"value": "%"},

"units": {"value": "%"}

}

}},

{"Observation": {

"text": {

"status": {"value": "empty"},

"div": "<div>Missing<\/div>"

},

"\_id": "r17",

"status": {"value": "final"},

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Basophils"},

"code": {"value": "704-7"}

}]},

"reliability": {"value": "ok"},

"referenceRange": [{"rangeQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0.21"},

"code": {"value": "10\*9/L"},

"comparator": {"value": "<"},

"units": {"value": "x10\*9/L"}

}}],

"valueQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "0.92"},

"code": {"value": "10\*9/L"},

"units": {"value": "x10\*9/L"}

}

}}

],

"diagnosticTime": {"value": "2011-03-04T08:30:00+11:00"},

"serviceCategory": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v2/0074"},

"code": {"value": "HM"}

}]},

"reportId": {

"system": {"value": "http://acme.com/lab/reports"},

"key": {"value": "5234342"}

}

}}

## 4.17: Examples: Document

Examples for the [Document (§2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document) resource.

#### 4.17.0.19: DischargeSummary

Example of a discharge summary

Example of a discharge summary (id = "father")

<feed xmlns="http://www.w3.org/2005/Atom">

<title>**Discharge Summary**</title>

<id>**urn:uuid:500bee81-d973-4afe-b592-d39fe71e38**</id>

<link href="urn:guid:180f219f-97a8-486d-99d9-ed631fe4fc52" rel="self"/>

<updated>**2013-05-28T22:12:21Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<!-- The document resource -->

<entry>

<title>**Document**</title>

<id>**urn:guid:180f219f-97a8-486d-99d9-ed631fe4fc57**</id>

<updated>**2013-05-28T22:12:21Z**</updated>

<content type="text/xml">

<Document xmlns="http://hl7.org/fhir">

<created value="2013-02-01T12:30:02"/>

<type>

<coding>

<system value="www.loinc.org"/>

<code value="28655-9"/>

</coding>

<text value="Discharge Summary from Responsible Clinician"/>

</type>

<status value="final"/>

<confidentiality>

<system value="www.nz.org"/>

<code value="1234-5"/>

<display value="Normal"/>

</confidentiality>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"/>

<display value="Eve Everywoman"/>

</subject>

<author>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="http://hl7connect.healthintersections.com.au/svc/fhir/practitioner/@example"/>

<display value="Doctor Dave"/>

</author>

<!-- The Encounter resource. Points directly to an Encounter resource. Contains the dates of admission, specialty etc. -->

<section>

<code>

<text value="Encounter Information"/>

</code>

<content>

<type value="[Encounter](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter)"/>

<reference value="http://hl7connect.healthintersections.com.au/svc/fhir/encounter/@example"/>

</content>

</section>

<section>

<code>

<coding>

<system value="http://loinc.org"/>

<code value="46241-6"/>

</coding>

<text value="Reason for admission"/>

</code>

<content>

<type value="[Observation](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation)"/>

<reference value="urn:guid:d0dd51d3-3ab2-4c84-b697-a630c3e40e7a"/>

</content>

</section>

<!-- Points to the list that groups the medications on discharge -->

<section>

<code>

<coding>

<system value="http://loinc.org"/>

<code value="10183-2"/>

</coding>

<text value="Medications on Discharge"/>

</code>

<content>

<type value="[List](http://hl7.org/implement/standards/fhir/fhir-book.htm#list)"/>

<reference value="urn:guid:673f8db5-0ffd-4395-9657-6da00420bbc1"/>

</content>

</section>

<!-- Points to the list that groups the allergies -->

<section>

<code>

<coding>

<system value="http://loinc.org"/>

<code value="48765-2"/>

</coding>

<text value="Known allergies"/>

</code>

<content>

<type value="[List](http://hl7.org/implement/standards/fhir/fhir-book.htm#list)"/>

<reference value="urn:guid:68f86194-e6e1-4f65-b64a-5314256f8d7b"/>

</content>

</section>

</Document>

</content>

</entry>

<!-- The Practitioner Resource. In this document they are the author of the document

(There is a reference from the document resource). Note that, strictly, it doesn't need to be within the document as the

recipient knows where to go and get it if they need it - assuming it is available on-line of course. -->

<entry>

<title>**Written by Doctor Dave**</title>

<id>**http://hl7connect.healthintersections.com.au/svc/fhir/practitioner/@example**</id>

<link href="http://hl7connect.healthintersections.com.au/svc/fhir/practitioner/@example/history/@1" rel="self"/>

<updated>**2013-05-05T16:13:03Z**</updated>

<published>**2013-05-28T22:12:21Z**</published>

<author>

<name>**68.151.217.168**</name>

</author>

<content type="text/xml">

<Practitioner xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<h5>**Doctor Dave**</h5>

</div>

</text>

<name>

<text value="Doctor Dave"/>

</name>

</Practitioner>

</content>

</entry>

<!-- The Patient who is the subject of the document. Same comments as practitioner. -->

<entry>

<title>**About Eve Everywoman**</title>

<id>**http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1**</id>

<link href="http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1/history/@10" rel="self"/>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**68.151.217.168**</name>

</author>

<content type="text/xml">

<Patient xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<h5>**Eve Everywoman**</h5>

</div>

</text>

<identifier>

<system value="nhi"/>

</identifier>

<name>

<text value="Eve Everywoman"/>

<family value="Everywoman1"/>

<given value="Eve"/>

</name>

<telecom>

<system value="phone"/>

<value value="555-555-2003"/>

<use value="work"/>

</telecom>

<gender>

<coding>

<system value="http://hl7.org/fhir/v3/AdministrativeGender"/>

<code value="F"/>

<display value="Female"/>

</coding>

</gender>

<birthDate value="1955-01-06"/>

<address>

<use value="home"/>

<line value="2222 Home Street"/>

</address>

<active value="true"/>

</Patient>

</content>

<summary type="xhtml">

<div xmlns="http://www.w3.org/1999/xhtml">

<h5>**Eve Everywoman**</h5>

</div>

</summary>

</entry>

<!-- The encounter that is being documented. -->

<entry>

<title>**Admission to Middlemore** </title>

<id>**http://hl7connect.healthintersections.com.au/svc/fhir/encounter/@example**</id>

<link href="http://hl7connect.healthintersections.com.au/svc/fhir/encounter/@example/history/@1" rel="self"/>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**68.151.217.168**</name>

</author>

<content type="text/xml">

<Encounter xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml"> **Admitted to Orthopedics Service,**

**Middlemore Hospital between Jan 20 and Feb 1st 2013** </div>

</text>

<identifier>

<key value="S100"/>

</identifier>

<status value="finished"/>

<class value="inpatient"/>

<type>

<text value="Orthopedic Admission"/>

</type>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"/>

</subject>

<hospitalization>

<period>

<start value="2013-01-20T12:30:02"/>

<end value="2013-02-01T12:30:02"/>

</period>

<dischargeDisposition>

<text value="Discharged to care of GP"/>

</dischargeDisposition>

</hospitalization>

</Encounter>

</content>

</entry>

<!-- The Reason for admission. -->

<entry>

<title>**Admission Reason**</title>

<id>**urn:guid:d0dd51d3-3ab2-4c84-b697-a630c3e40e7a**</id>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<content type="text/xml">

<Observation xmlns="http://hl7.org/fhir">

<text>

<status value="additional"/>

<div xmlns="http://www.w3.org/1999/xhtml"> **Acute Asthmatic attack. Was wheezing**

**for days prior to admission.** </div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="46241-6"/>

</coding>

<text value="Reason for admission"/>

</name>

<valueString value="Acute Asthmatic attack. Was wheezing for days prior to admission."/>

<status value="final"/>

<reliability value="ok"/>

</Observation>

</content>

</entry>

<!-- The list of medications on discharge -->

<entry>

<title>**List of Medications**</title>

<id>**urn:guid:673f8db5-0ffd-4395-9657-6da00420bbc1**</id>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<content type="text/xml">

<List xmlns="http://hl7.org/fhir">

<text>

<status value="additional"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<table>

<thead>

<tr>

<td>**Medication**</td>

<td>**Last Change**</td>

<td>**Last Change Reason**</td>

</tr>

</thead>

<tbody>

<tr>

<td>**Theophylline 200mg BD after meals**</td>

<td>**continued**</td>

</tr>

<tr>

<td>**Ventolin Inhaler**</td>

<td>**stopped**</td>

<td>**Getting side effect of tremor**</td>

</tr>

</tbody>

</table>

</div>

</text>

<code>

<coding>

<system value="http://loinc.org"/>

<code value="10183-2"/>

<display value="Medication List"/>

</coding>

</code>

<mode value="working"/>

<!-- This is an entry that refers to a MedicationPrescription resource in this document.

It is a new medication (as indicated by the flag) -->

<entry>

<flag>

<coding>

<!-- The flag refers to the valueset containing permissible codes for changes

to medication status that occurred during this encounter. Possible values are started,

continued, stopped, changed -->

<system value="http://www.ithealthboard.health.nz/fhir/valueset/@medicationStatus"/>

<code value="started"/>

</coding>

</flag>

<item>

<type value="[MedicationPrescription](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription)"/>

<reference value="urn:guid:124a6916-5d84-4b8c-b250-10cefb8e6e86"/>

</item>

</entry>

<!-- This is an entry that refers to a medicationPrescription that is available on an external server.

In practice, you may still want an entry in the document as well, but it's not necessary. The medication

was stopped on this admission. Note that the deleted element is also true. Because the resource is

no longer active, we assume that it was deleted on the server, so following the link would result

in an http status code of 410 (Though you can always use the history to get previous versions) -->

<entry>

<flag>

<coding>

<system value="http://www.ithealthboard.health.nz/fhir/valueset/@medicationStatus"/>

<code value="stopped"/>

</coding>

</flag>

<deleted value="true"/>

<item>

<type value="[MedicationPrescription](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription)"/>

<reference value="http://hl7connect.healthintersections.com.au/svc/fhir/medicationprescription/@1"/>

<display value="use of Ventolin Inhaler was discontinued"/>

</item>

</entry>

</List>

</content>

</entry>

<!-- The first medication in the medications list -->

<entry>

<title>**Medication #1**</title>

<id>**urn:guid:124a6916-5d84-4b8c-b250-10cefb8e6e86**</id>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<content type="text/xml">

<MedicationPrescription xmlns="http://hl7.org/fhir">

<!-- The Human readable version of the script -->

<text>

<status value="generated"/>

<!-- This text section can be exactly the same as CDA -->

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Theophylline 200mg twice a day**</p>

</div>

</text>

<!-- The medication. This is currently modelled as a contained resource within the prescription, but could also be a separate

resource either within the document bundle, or a reference to the medication on a server. The latter

(ie where the medication terminology is hosted on a publically available server and simply referenced from the

MedicationPrescription resource is particularly attractive... -->

<contained>

<Medication id="med1">

<name value="Theophylline 200mg"/>

<code>

<coding>

<system value="http:/snomed.org"/>

<code value="66493003"/>

</coding>

</code>

</Medication>

</contained>

<!-- The patient details will generally be in the Document resource in the Document bundle, but could just as easily

point to a patient resource on a server -->

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"/>

<display value="Peter Patient"/>

</patient>

<!-- The prescriber details could also be within the bundle, but has the same options as patient -->

<prescriber>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

<display value="Peter Practitioner"/>

</prescriber>

<reasonForPrescribingString value="Management of Asthma"/>

<!-- a reference to the medication being prescribed. As described earlier, this could be contained (as is the example here), separately

within the document bundle or simply a reference to a remote server. See comment in the contained resource -->

<medication>

<type value="[Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication)"/>

<reference value="[medication/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-example)"/>

<display value="Theophylline 200mg BD"/>

</medication>

<dosageInstructions>

<additionalInstructionsString value="Take with Food"/>

<!-- twice a day -->

<timingSchedule>

<repeat>

<frequency value="2"/>

<duration value="1"/>

<units value="d"/>

</repeat>

</timingSchedule>

<!-- Orally -->

<route>

<coding>

<system value="http://snomed.info"/>

<code value="363743006"/>

<display value="oral administration of treatment"/>

</coding>

</route>

<doseQuantity>

<value value="1"/>

<units value="tablet"/>

<system value="http://unitsofmeasure.org"/>

<code value="tbl"/>

</doseQuantity>

</dosageInstructions>

</MedicationPrescription>

</content>

</entry>

<!-- The list of known allergies -->

<entry>

<title>**List of Allergies**</title>

<id>**urn:guid:68f86194-e6e1-4f65-b64a-5314256f8d7b**</id>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<content type="text/xml">

<List xmlns="http://hl7.org/fhir">

<text>

<status value="additional"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<table>

<thead>

<tr>

<td>**Allergen**</td>

<td>**Reaction**</td>

</tr>

</thead>

<tbody>

<tr>

<td>**Doxycycline**</td>

<td>**Hives**</td>

</tr>

</tbody>

</table>

</div>

</text>

<code>

<coding>

<system value="http://loinc.org"/>

<code value="48765-2"/>

<display value="Allergies"/>

</coding>

</code>

<mode value="working"/>

<!-- This is an entry that refers to an allergy resource in this document. -->

<entry>

<item>

<type value="[AllergyIntolerance](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance)"/>

<reference value="urn:guid:47600e0f-b6b5-4308-84b5-5dec157f7637"/>

</item>

</entry>

</List>

</content>

</entry>

<!-- The Allergy. -->

<entry>

<title>**Allergy to Doxycycline**</title>

<id>**urn:guid:47600e0f-b6b5-4308-84b5-5dec157f7637**</id>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<content type="text/xml">

<AllergyIntolerance xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Sensitivity to Doxycycline :**

**Hives**</div>

</text>

<criticality value="fatal"/>

<sensitivityType value="allergy"/>

<recordedDate value="2012-09-17"/>

<status value="confirmed"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"/>

<display value="Eve Everywoman"/>

</subject>

<substance>

<type value="[Substance](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance)"/>

<reference value="urn:guid:4c2d16c0-b102-486c-aa7c-b266ce98709f"/>

<display value="Doxycycline"/>

</substance>

<reactions>

<type value="[AdverseReaction](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction)"/>

<reference value="urn:guid:25be7cdf-7055-40fa-80ac-defd531180dd"/>

<display value="Hives"/>

</reactions>

</AllergyIntolerance>

</content>

</entry>

<!-- The adverse reaction -->

<entry>

<title>**Adverse Reaction**</title>

<id>**urn:guid:25be7cdf-7055-40fa-80ac-defd531180dd**</id>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<content type="text/xml">

<AdverseReaction xmlns="http://hl7.org/fhir">

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"/>

<display value="Eve Everywoman"/>

</subject>

<didNotOccurFlag value="false"/>

<symptom>

<code>

<coding>

<system value="sys"/>

<code value="xxx"/>

<display value="Hives"/>

</coding>

<text value="Hives"/>

</code>

</symptom>

</AdverseReaction>

</content>

</entry>

<!-- Substance -->

<entry>

<title>**Substance**</title>

<id>**urn:guid:4c2d16c0-b102-486c-aa7c-b266ce98709f**</id>

<updated>**2013-05-05T16:13:03Z**</updated>

<author>

<name>**Dr Dave**</name>

</author>

<content type="text/xml">

<Substance xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Doxycycline**</div>

</text>

<name value="Doxycycline"/>

<type>

<coding>

<system value="codesys"/>

<code value="123445"/>

<display value="Doxycycline"/>

</coding>

</type>

</Substance>

</content>

</entry>

</feed>

JSON Equivalent

Example of a discharge summary

{

"id": "urn:uuid:500bee81-d973-4afe-b592-d39fe71e38",

"authors": [{"name": "Dr Dave"}],

"title": "Discharge Summary",

"updated": "2013-05-28T22:12:21Z",

"entries": [

{

"content": {"Document": {

"author": [{

"display": {"value": "Doctor Dave"},

"type": {"value": "Practitioner"},

"reference": {"value": "http://hl7connect.healthintersections.com.au/svc/fhir/practitioner/@example"}

}],

"status": {"value": "final"},

"created": {"value": "2013-02-01T12:30:02+11:00"},

"subject": {

"display": {"value": "Eve Everywoman"},

"type": {"value": "Patient"},

"reference": {"value": "http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"}

},

"confidentiality": {

"system": {"value": "www.nz.org"},

"display": {"value": "Normal"},

"code": {"value": "1234-5"}

},

"type": {

"text": {"value": "Discharge Summary from Responsible Clinician"},

"coding": [{

"system": {"value": "www.loinc.org"},

"code": {"value": "28655-9"}

}]

},

"section": [

{

"content": {

"type": {"value": "Encounter"},

"reference": {"value": "http://hl7connect.healthintersections.com.au/svc/fhir/encounter/@example"}

},

"code": {"text": {"value": "Encounter Information"}}

},

{

"content": {

"type": {"value": "Observation"},

"reference": {"value": "urn:guid:d0dd51d3-3ab2-4c84-b697-a630c3e40e7a"}

},

"code": {

"text": {"value": "Reason for admission"},

"coding": [{

"system": {"value": "http://loinc.org"},

"code": {"value": "46241-6"}

}]

}

},

{

"content": {

"type": {"value": "List"},

"reference": {"value": "urn:guid:673f8db5-0ffd-4395-9657-6da00420bbc1"}

},

"code": {

"text": {"value": "Medications on Discharge"},

"coding": [{

"system": {"value": "http://loinc.org"},

"code": {"value": "10183-2"}

}]

}

},

{

"content": {

"type": {"value": "List"},

"reference": {"value": "urn:guid:68f86194-e6e1-4f65-b64a-5314256f8d7b"}

},

"code": {

"text": {"value": "Known allergies"},

"coding": [{

"system": {"value": "http://loinc.org"},

"code": {"value": "48765-2"}

}]

}

}

]

}},

"id": "urn:guid:180f219f-97a8-486d-99d9-ed631fe4fc57",

"title": "Document",

"updated": "2013-05-28T22:12:21Z"

},

{

"content": {"Practitioner": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <h5>Doctor Dave<\/h5>\n <\/div>"

},

"name": {"text": {"value": "Doctor Dave"}}

}},

"id": "http://hl7connect.healthintersections.com.au/svc/fhir/practitioner/@example",

"authors": [{"name": "68.151.217.168"}],

"title": "Written by Doctor Dave",

"updated": "2013-05-05T16:13:03Z",

"links": [{

"rel": "self",

"href": "http://hl7connect.healthintersections.com.au/svc/fhir/practitioner/@example/history/@1"

}],

"published": "2013-05-28T22:12:21Z"

},

{

"summary": "<div>\n <h5>Eve Everywoman<\/h5>\n <\/div>",

"content": {"Patient": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <h5>Eve Everywoman<\/h5>\n <\/div>"

},

"address": [{

"line": [{"value": "2222 Home Street"}],

"use": {"value": "home"}

}],

"name": [{

"text": {"value": "Eve Everywoman"},

"given": [{"value": "Eve"}],

"family": [{"value": "Everywoman1"}]

}],

"telecom": [{

"system": {"value": "phone"},

"value": {"value": "555-555-2003"},

"use": {"value": "work"}

}],

"active": {"value": "true"},

"gender": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v3/AdministrativeGender"},

"display": {"value": "Female"},

"code": {"value": "F"}

}]},

"birthDate": {"value": "1955-01-06"},

"identifier": [{"system": {"value": "nhi"}}]

}},

"id": "http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1",

"authors": [{"name": "68.151.217.168"}],

"title": "About Eve Everywoman",

"updated": "2013-05-05T16:13:03Z",

"links": [{

"rel": "self",

"href": "http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1/history/@10"

}]

},

{

"content": {"Encounter": {

"hospitalization": {

"dischargeDisposition": {"text": {"value": "Discharged to care of GP"}},

"period": {

"start": {"value": "2013-01-20T12:30:02"},

"end": {"value": "2013-02-01T12:30:02"}

}

},

"text": {

"status": {"value": "generated"},

"div": "<div> Admitted to Orthopedics Service,\n Middlemore Hospital between Jan 20 and Feb 1st 2013 <\/div>"

},

"status": {"value": "finished"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"}

},

"class": {"value": "inpatient"},

"type": [{"text": {"value": "Orthopedic Admission"}}],

"identifier": [{"key": {"value": "S100"}}]

}},

"id": "http://hl7connect.healthintersections.com.au/svc/fhir/encounter/@example",

"authors": [{"name": "68.151.217.168"}],

"title": "Admission to Middlemore ",

"updated": "2013-05-05T16:13:03Z",

"links": [{

"rel": "self",

"href": "http://hl7connect.healthintersections.com.au/svc/fhir/encounter/@example/history/@1"

}]

},

{

"content": {"Observation": {

"text": {

"status": {"value": "additional"},

"div": "<div> Acute Asthmatic attack. Was wheezing\n for days prior to admission. <\/div>"

},

"status": {"value": "final"},

"name": {

"text": {"value": "Reason for admission"},

"coding": [{

"system": {"value": "http://loinc.org"},

"code": {"value": "46241-6"}

}]

},

"reliability": {"value": "ok"},

"valueString": {"value": "Acute Asthmatic attack. Was wheezing for days prior to admission."}

}},

"id": "urn:guid:d0dd51d3-3ab2-4c84-b697-a630c3e40e7a",

"authors": [{"name": "Dr Dave"}],

"title": "Admission Reason",

"updated": "2013-05-05T16:13:03Z"

},

{

"content": {"List": {

"text": {

"status": {"value": "additional"},

"div": "<div>\n <table>\n <thead>\n <tr>\n <td>Medication<\/td>\n <td>Last Change<\/td>\n <td>Last Change Reason<\/td>\n <\/tr>\n <\/thead>\n <tbody>\n <tr>\n <td>Theophylline 200mg BD after meals<\/td>\n <td>continued<\/td>\n <\/tr>\n <tr>\n <td>Ventolin Inhaler<\/td>\n <td>stopped<\/td>\n <td>Getting side effect of tremor<\/td>\n <\/tr>\n <\/tbody>\n\n <\/table>\n <\/div>"

},

"entry": [

{

"flag": [{"coding": [{

"system": {"value": "http://www.ithealthboard.health.nz/fhir/valueset/@medicationStatus"},

"code": {"value": "started"}

}]}],

"item": {

"type": {"value": "MedicationPrescription"},

"reference": {"value": "urn:guid:124a6916-5d84-4b8c-b250-10cefb8e6e86"}

}

},

{

"flag": [{"coding": [{

"system": {"value": "http://www.ithealthboard.health.nz/fhir/valueset/@medicationStatus"},

"code": {"value": "stopped"}

}]}],

"item": {

"display": {"value": "use of Ventolin Inhaler was discontinued"},

"type": {"value": "MedicationPrescription"},

"reference": {"value": "http://hl7connect.healthintersections.com.au/svc/fhir/medicationprescription/@1"}

},

"deleted": {"value": "true"}

}

],

"code": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Medication List"},

"code": {"value": "10183-2"}

}]},

"mode": {"value": "working"}

}},

"id": "urn:guid:673f8db5-0ffd-4395-9657-6da00420bbc1",

"authors": [{"name": "Dr Dave"}],

"title": "List of Medications",

"updated": "2013-05-05T16:13:03Z"

},

{

"content": {"MedicationPrescription": {

"medication": {

"display": {"value": "Theophylline 200mg BD"},

"type": {"value": "Medication"},

"reference": {"value": "medication/@example"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Theophylline 200mg twice a day<\/p>\n <\/div>"

},

"patient": {

"display": {"value": "Peter Patient"},

"type": {"value": "Patient"},

"reference": {"value": "http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"}

},

"reasonForPrescribingString": {"value": "Management of Asthma"},

"prescriber": {

"display": {"value": "Peter Practitioner"},

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"dosageInstructions": [{

"timingSchedule": {"repeat": {

"duration": {"value": "1"},

"frequency": {"value": "2"},

"units": {"value": "d"}

}},

"doseQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "1"},

"code": {"value": "tbl"},

"units": {"value": "tablet"}

},

"route": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "oral administration of treatment"},

"code": {"value": "363743006"}

}]},

"additionalInstructionsString": {"value": "Take with Food"}

}],

"contained": [{"Medication": {

"\_id": "med1",

"name": {"value": "Theophylline 200mg"},

"code": {"coding": [{

"system": {"value": "http:/snomed.org"},

"code": {"value": "66493003"}

}]}

}}]

}},

"id": "urn:guid:124a6916-5d84-4b8c-b250-10cefb8e6e86",

"authors": [{"name": "Dr Dave"}],

"title": "Medication #1",

"updated": "2013-05-05T16:13:03Z"

},

{

"content": {"List": {

"text": {

"status": {"value": "additional"},

"div": "<div>\n <table>\n <thead>\n <tr>\n <td>Allergen<\/td>\n <td>Reaction<\/td>\n <\/tr>\n <\/thead>\n <tbody>\n <tr>\n <td>Doxycycline<\/td>\n <td>Hives<\/td>\n <\/tr>\n <\/tbody>\n\n <\/table>\n <\/div>"

},

"entry": [{"item": {

"type": {"value": "AllergyIntolerance"},

"reference": {"value": "urn:guid:47600e0f-b6b5-4308-84b5-5dec157f7637"}

}}],

"code": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Allergies"},

"code": {"value": "48765-2"}

}]},

"mode": {"value": "working"}

}},

"id": "urn:guid:68f86194-e6e1-4f65-b64a-5314256f8d7b",

"authors": [{"name": "Dr Dave"}],

"title": "List of Allergies",

"updated": "2013-05-05T16:13:03Z"

},

{

"content": {"AllergyIntolerance": {

"substance": {

"display": {"value": "Doxycycline"},

"type": {"value": "Substance"},

"reference": {"value": "urn:guid:4c2d16c0-b102-486c-aa7c-b266ce98709f"}

},

"criticality": {"value": "fatal"},

"text": {

"status": {"value": "generated"},

"div": "<div>Sensitivity to Doxycycline :\n Hives<\/div>"

},

"reactions": [{

"display": {"value": "Hives"},

"type": {"value": "AdverseReaction"},

"reference": {"value": "urn:guid:25be7cdf-7055-40fa-80ac-defd531180dd"}

}],

"status": {"value": "confirmed"},

"sensitivityType": {"value": "allergy"},

"subject": {

"display": {"value": "Eve Everywoman"},

"type": {"value": "Patient"},

"reference": {"value": "http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"}

},

"recordedDate": {"value": "2012-09-17"}

}},

"id": "urn:guid:47600e0f-b6b5-4308-84b5-5dec157f7637",

"authors": [{"name": "Dr Dave"}],

"title": "Allergy to Doxycycline",

"updated": "2013-05-05T16:13:03Z"

},

{

"content": {"AdverseReaction": {

"didNotOccurFlag": {"value": "false"},

"subject": {

"display": {"value": "Eve Everywoman"},

"type": {"value": "Patient"},

"reference": {"value": "http://hl7connect.healthintersections.com.au/svc/fhir/patient/@d1"}

},

"symptom": [{"code": {

"text": {"value": "Hives"},

"coding": [{

"system": {"value": "sys"},

"display": {"value": "Hives"},

"code": {"value": "xxx"}

}]

}}]

}},

"id": "urn:guid:25be7cdf-7055-40fa-80ac-defd531180dd",

"authors": [{"name": "Dr Dave"}],

"title": "Adverse Reaction",

"updated": "2013-05-05T16:13:03Z"

},

{

"content": {"Substance": {

"text": {

"status": {"value": "generated"},

"div": "<div>Doxycycline<\/div>"

},

"name": {"value": "Doxycycline"},

"type": {"coding": [{

"system": {"value": "codesys"},

"display": {"value": "Doxycycline"},

"code": {"value": "123445"}

}]}

}},

"id": "urn:guid:4c2d16c0-b102-486c-aa7c-b266ce98709f",

"authors": [{"name": "Dr Dave"}],

"title": "Substance",

"updated": "2013-05-05T16:13:03Z"

}

],

"links": [{

"rel": "self",

"href": "urn:guid:180f219f-97a8-486d-99d9-ed631fe4fc52"

}]

}

## 4.18: Examples: DocumentReference

Examples for the [DocumentReference (§3.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference) resource.

#### 4.18.0.20: General

Example of documentreference

Example of documentreference (id = "example")

<DocumentReference xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Text**</div>

</text>

<contained>

<!-- Many XDS systems do not track any id for the author. When systems don't do this,

the only option is for the author information to be contained in the Document Reference -->

<Practitioner id="a1">

<name>

<family value="Dopplemeyer"/>

<given value="Sherry"/>

</name>

<telecom>

<system value="email"/>

<value value="john.doe@healthcare.example.org"/>

</telecom>

<organization>

<display value="Cleveland Clinic"/>

</organization>

<!--

&lt;organization&gt;

&lt;display value=&quot;Berea Community&quot;/&gt;

&lt;/organization&gt;

-->

<role><text value="Primary Surgeon"/></role>

<specialty><text value="Orthopedic"/></specialty>

</Practitioner>

</contained>

<contained>

<Practitioner id="a2">

<name>

<family value="Smitty"/>

<given value="Gerald"/>

</name>

<telecom>

<system value="email"/>

<value value="john.doe@healthcare.example.org"/>

</telecom>

<organization>

<display value="Cleveland Clinic"/>

</organization>

<!--

&lt;organization&gt;

&lt;display value=&quot;Parma Community&quot;/&gt;

&lt;/organization&gt;

-->

<role><text value="Attending"/></role>

<specialty><text value="Orthopedic"/></specialty>

</Practitioner>

</contained>

<masterIdentifier>

<system value="urn:ietf:rfc:3986"/>

<key value="urn:oid:1.3.6.1.4.1.21367.2005.3.7"/>

</masterIdentifier>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@xcda](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-xcda)"/>

</subject>

<type>

<coding>

<system value="http://loinc.org"/>

<code value="34108-1"/>

<display value="Outpatient Evaluation And Management"/>

</coding>

</type>

<author>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#a1"/>

</author>

<author>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#a2"/>

</author>

<created value="2005-12-24T09:35:00+11:00"/>

<indexed value="2005-12-24T09:43:41+11:00"/>

<status value="current"/>

<description value="Physical"/>

<confidentiality>

<coding>

<system value="http://ihe.net/xds/connectathon/confidentialityCodes"/>

<code value="1.3.6.1.4.1.21367.2006.7.101"/>

<display value="Clinical-Staff"/>

</coding>

</confidentiality>

<primaryLanguage value="en-US"/>

<mimeType value="application/hl7-v3+xml"/>

<size value="3654"/>

<hash value="da39a3ee5e6b4b0d3255bfef95601890afd80709"/>

<location value="http://example.org/xds/mhd/binary/@07a6483f-732b-461e-86b6-edb665c45510"/>

<context>

<code>

<coding>

<system value="http://ihe.net/xds/connectathon/eventCodes"/>

<code value="todo"/>

<display value="to do"/>

</coding>

</code>

<period>

<start value="2004-12-23T08:00:00"/>

<end value="2004-12-23T08:01:00"/>

</period>

<facilityType>

<coding>

<system value="http://www.ihe.net/xds/connectathon/healthcareFacilityTypeCodes"/>

<code value="Outpatient"/>

<display value="Outpatient"/>

</coding>

</facilityType>

</context>

<!--

&lt;class&gt;

&lt;system value=&quot;http://ihe.net/xds/connectathon/classCodes&quot;/&gt;

&lt;code value=&quot;History and Physical&quot;/&gt;

&lt;display value=&quot;History and Physical&quot;/&gt;

&lt;/class&gt;

&lt;practiceSetting&gt;

&lt;coding&gt;

&lt;system value=&quot;http://www.ihe.net/xds/connectathon/practiceSettingCodes&quot;/&gt;

&lt;code value=&quot;General Medicine&quot;/&gt;

&lt;display value=&quot;General Medicine&quot;/&gt;

&lt;/coding&gt;

&lt;/practiceSetting&gt;

&lt;currentSubject&gt;

&lt;type value=&quot;Patient&quot;/&gt;

&lt;reference value=&quot;patient/@xcda&quot;/&gt;

&lt;/currentSubject&gt;

-->

</DocumentReference>

JSON Equivalent

Example of documentreference

{"DocumentReference": {

"text": {

"status": {"value": "generated"},

"div": "<div>Text<\/div>"

},

"location": {"value": "http://example.org/xds/mhd/binary/@07a6483f-732b-461e-86b6-edb665c45510"},

"hash": {"value": "da39a3ee5e6b4b0d3255bfef95601890afd80709"},

"indexed": {"value": "2005-12-24T09:43:41+11:00"},

"status": {"value": "current"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@xcda"}

},

"contained": [

{"Practitioner": {

"organization": {"display": {"value": "Cleveland Clinic"}},

"\_id": "a1",

"name": {

"given": [{"value": "Sherry"}],

"family": [{"value": "Dopplemeyer"}]

},

"telecom": [{

"system": {"value": "email"},

"value": {"value": "john.doe@healthcare.example.org"}

}],

"role": [{"text": {"value": "Primary Surgeon"}}],

"specialty": [{"text": {"value": "Orthopedic"}}]

}},

{"Practitioner": {

"organization": {"display": {"value": "Cleveland Clinic"}},

"\_id": "a2",

"name": {

"given": [{"value": "Gerald"}],

"family": [{"value": "Smitty"}]

},

"telecom": [{

"system": {"value": "email"},

"value": {"value": "john.doe@healthcare.example.org"}

}],

"role": [{"text": {"value": "Attending"}}],

"specialty": [{"text": {"value": "Orthopedic"}}]

}}

],

"masterIdentifier": {

"system": {"value": "urn:ietf:rfc:3986"},

"key": {"value": "urn:oid:1.3.6.1.4.1.21367.2005.3.7"}

},

"type": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Outpatient Evaluation And Management"},

"code": {"value": "34108-1"}

}]},

"primaryLanguage": {"value": "en-US"},

"size": {"value": "3654"},

"author": [

{

"type": {"value": "Practitioner"},

"reference": {"value": "#a1"}

},

{

"type": {"value": "Practitioner"},

"reference": {"value": "#a2"}

}

],

"created": {"value": "2005-12-24T09:35:00+11:00"},

"description": {"value": "Physical"},

"confidentiality": {"coding": [{

"system": {"value": "http://ihe.net/xds/connectathon/confidentialityCodes"},

"display": {"value": "Clinical-Staff"},

"code": {"value": "1.3.6.1.4.1.21367.2006.7.101"}

}]},

"context": {

"facilityType": {"coding": [{

"system": {"value": "http://www.ihe.net/xds/connectathon/healthcareFacilityTypeCodes"},

"display": {"value": "Outpatient"},

"code": {"value": "Outpatient"}

}]},

"code": [{"coding": [{

"system": {"value": "http://ihe.net/xds/connectathon/eventCodes"},

"display": {"value": "to do"},

"code": {"value": "todo"}

}]}],

"period": {

"start": {"value": "2004-12-23T08:00:00"},

"end": {"value": "2004-12-23T08:01:00"}

}

},

"mimeType": {"value": "application/hl7-v3+xml"}

}}

## 4.19: Examples: Encounter

Examples for the [Encounter (§3.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter) resource.

#### 4.19.0.21: example

Encounter example

Encounter example (id = "example")

<Encounter xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Encounter with patient @example**</div>

</text>

<status value="current"/>

<class value="inpatient"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

</Encounter>

JSON Equivalent

Encounter example

{"Encounter": {

"text": {

"status": {"value": "generated"},

"div": "<div>Encounter with patient @example<\/div>"

},

"status": {"value": "current"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"class": {"value": "inpatient"}

}}

## 4.20: Examples: FamilyHistory

Examples for the [FamilyHistory (§3.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory) resource.

#### 4.20.0.22: Father

Basic Example. Describes the father’s death at age 74 from a heart attack

Basic Example. Describes the father’s death at age 74 from a heart attack (id = "father")

<FamilyHistory xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Father died of a heart attack aged 74**</div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

<display value="Peter Patient"/>

</subject>

<relation>

<relationship>

<coding>

<system value="http://hl7.org/fhir/familial-relationship"/>

<code value="father"/>

</coding>

</relationship>

<condition>

<type>

<coding>

<system value="http://snomed.info"/>

<code value="315619001"/>

<display value="Myocardial Infarction"/>

</coding>

<text value="Heart Attack"/>

</type>

<onsetAge>

<value value="74"/>

<units value="a"/>

<system value="http://unitsofmeasure.org"/>

</onsetAge>

<note value="Was fishing at the time. At least he went doing something he loved."/>

</condition>

</relation>

</FamilyHistory>

JSON Equivalent

Basic Example. Describes the father’s death at age 74 from a heart attack

{"FamilyHistory": {

"text": {

"status": {"value": "generated"},

"div": "<div>Father died of a heart attack aged 74<\/div>"

},

"subject": {

"display": {"value": "Peter Patient"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"relation": [{

"relationship": {"coding": [{

"system": {"value": "http://hl7.org/fhir/familial-relationship"},

"code": {"value": "father"}

}]},

"condition": [{

"onsetQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "74"},

"units": {"value": "a"}

},

"type": {

"text": {"value": "Heart Attack"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Myocardial Infarction"},

"code": {"value": "315619001"}

}]

},

"note": {"value": "Was fishing at the time. At least he went doing something he loved."}

}]

}]

}}

#### 4.20.0.23: Mother

Mother died from a stroke aged 56. Brother with diabetes.

Mother died from a stroke aged 56. Brother with diabetes. (id = "mother")

<FamilyHistory xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Mother died of a stroke aged 56. Brother has diabetes**</div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="patient/@100"/>

<display value="Peter Patient"/>

</subject>

<relation>

<relationship>

<coding>

<system value="http://hl7.org/fhir/familial-relationship"/>

<code value="mother"/>

</coding>

</relationship>

<condition>

<type>

<coding>

<system value="http://snomed.info"/>

<code value="371041009"/>

<display value="Embolic Stroke"/>

</coding>

<text value="Stroke"/>

</type>

<onsetAge>

<value value="56"/>

<units value="a"/>

<system value="http://unitsofmeasure.org"/>

</onsetAge>

</condition>

</relation>

<relation>

<relationship>

<coding>

<system value="http://hl7.org/fhir/familial-relationship"/>

<code value="brother"/>

</coding>

</relationship>

<condition>

<type>

<coding>

<system value="http://snomed.info"/>

<code value="190372001"/>

<display value="Type 1 Diabetes, Maturity Onset"/>

</coding>

<text value="Diabetes Mellitus"/>

</type>

</condition>

</relation>

</FamilyHistory>

JSON Equivalent

Mother died from a stroke aged 56. Brother with diabetes.

{"FamilyHistory": {

"text": {

"status": {"value": "generated"},

"div": "<div>Mother died of a stroke aged 56. Brother has diabetes<\/div>"

},

"subject": {

"display": {"value": "Peter Patient"},

"type": {"value": "Patient"},

"reference": {"value": "patient/@100"}

},

"relation": [

{

"relationship": {"coding": [{

"system": {"value": "http://hl7.org/fhir/familial-relationship"},

"code": {"value": "mother"}

}]},

"condition": [{

"onsetQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "56"},

"units": {"value": "a"}

},

"type": {

"text": {"value": "Stroke"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Embolic Stroke"},

"code": {"value": "371041009"}

}]

}

}]

},

{

"relationship": {"coding": [{

"system": {"value": "http://hl7.org/fhir/familial-relationship"},

"code": {"value": "brother"}

}]},

"condition": [{"type": {

"text": {"value": "Diabetes Mellitus"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Type 1 Diabetes, Maturity Onset"},

"code": {"value": "190372001"}

}]

}}]

}

]

}}

## 4.21: Examples: Group

Examples for the [Group (§3.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#group) resource.

#### 4.21.0.24: General

General Group Example

General Group Example (id = "101")

<Group xmlns="http://hl7.org/fhir">

<text>

<status value="additional"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Herd of 25 horses**</p>

<p>**Gender: mixed**</p>

<p>**Owner: John Smith**</p>

</div>

</text>

<type value="animal"/>

<actual value="true"/>

<code>

<text value="Horse"/>

</code>

<name value="John's herd"/>

<quantity value="25"/>

<characteristic>

<type>

<text value="gender"/>

</type>

<valueString value="mixed"/>

<exclude value="false"/>

</characteristic>

<characteristic>

<type>

<text value="owner"/>

</type>

<valueString value="John Smith"/>

<exclude value="false"/>

</characteristic>

</Group>

JSON Equivalent

General Group Example

{"Group": {

"text": {

"status": {"value": "additional"},

"div": "<div>\n <p>Herd of 25 horses<\/p>\n <p>Gender: mixed<\/p>\n <p>Owner: John Smith<\/p>\n <\/div>"

},

"name": {"value": "John's herd"},

"actual": {"value": "true"},

"quantity": {"value": "25"},

"code": {"text": {"value": "Horse"}},

"characteristic": [

{

"exclude": {"value": "false"},

"valueString": {"value": "mixed"},

"type": {"text": {"value": "gender"}}

},

{

"exclude": {"value": "false"},

"valueString": {"value": "John Smith"},

"type": {"text": {"value": "owner"}}

}

],

"type": {"value": "animal"}

}}

## 4.22: Examples: ImagingStudy

Examples for the [ImagingStudy (§3.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy) resource.

#### 4.22.0.25: General

Example of imagingstudy

Example of imagingstudy (id = "example")

<ImagingStudy xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Image 1 from Series 3: CT Images on Patient MINT (MINT1234) taken at 1-Jan 2011 01:20 AM**</div>

</text>

<dateTime value="2011-01-01T11:01:20"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@dicom](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-dicom)"/>

</subject>

<uid value="urn:oid:2.16.124.113543.6003.1154777499.30246.19789.3503430045"/>

<numberOfSeries value="1"/>

<numberOfInstances value="1"/>

<series>

<number value="3"/>

<modality value="CT"/>

<uid value="urn:oid:2.16.124.113543.6003.2588828330.45298.17418.2723805630"/>

<description value="CT Surview 180"/>

<numberOfInstances value="1"/>

<instance>

<number value="1"/>

<uid value="urn:oid:2.16.124.113543.6003.189642796.63084.16748.2599092903"/>

<sopclass value="urn:oid:1.2.840.10008.5.1.4.1.1.2"/>

<url value="http://localhost/fhir/binary/@1.2.840.11361907579238403408700.3.0.14.19970327150033"/>

</instance>

</series>

</ImagingStudy>

JSON Equivalent

Example of imagingstudy

{"ImagingStudy": {

"uid": {"value": "urn:oid:2.16.124.113543.6003.1154777499.30246.19789.3503430045"},

"series": [{

"uid": {"value": "urn:oid:2.16.124.113543.6003.2588828330.45298.17418.2723805630"},

"description": {"value": "CT Surview 180"},

"numberOfInstances": {"value": "1"},

"number": {"value": "3"},

"modality": {"value": "CT"},

"instance": [{

"sopclass": {"value": "urn:oid:1.2.840.10008.5.1.4.1.1.2"},

"uid": {"value": "urn:oid:2.16.124.113543.6003.189642796.63084.16748.2599092903"},

"number": {"value": "1"},

"url": {"value": "http://localhost/fhir/binary/@1.2.840.11361907579238403408700.3.0.14.19970327150033"}

}]

}],

"text": {

"status": {"value": "generated"},

"div": "<div>Image 1 from Series 3: CT Images on Patient MINT (MINT1234) taken at 1-Jan 2011 01:20 AM<\/div>"

},

"dateTime": {"value": "2011-01-01T11:01:20"},

"numberOfSeries": {"value": "1"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@dicom"}

},

"numberOfInstances": {"value": "1"}

}}

## 4.23: Examples: Immunization

Examples for the [Immunization (§3.19)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization) resource.

#### 4.23.0.26: General

Example of immunization

Example of immunization (id = "example")

<Immunization xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Authored by Joginder Madra**</div>

</text>

<date value="2013-01-10"/>

<vaccineType>

<coding>

<code value="396427003"/>

</coding>

</vaccineType>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<refusedIndicator value="false"/>

<reported value="false"/>

<performer>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</performer>

<lotNumber value="AAJN11K"/>

<expirationDate value="2015-02-15"/>

</Immunization>

JSON Equivalent

Example of immunization

{"Immunization": {

"reported": {"value": "false"},

"text": {

"status": {"value": "generated"},

"div": "<div>Authored by Joginder Madra<\/div>"

},

"expirationDate": {"value": "2015-02-15"},

"refusedIndicator": {"value": "false"},

"vaccineType": {"coding": [{"code": {"value": "396427003"}}]},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"performer": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"lotNumber": {"value": "AAJN11K"},

"date": {"value": "2013-01-10"}

}}

## 4.24: Examples: ImmunizationProfile

Examples for the [ImmunizationProfile (§3.20)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile) resource.

#### 4.24.0.27: General

Example of immunizationprofile

Example of immunizationprofile (id = "example")

<ImmunizationProfile xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Authored by Joginder Madra**</div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<recommendation>

<recommendationDate value="2013-03-01"/>

<vaccineType id="396427003"/>

<forecastStatus value="DUE"/>

</recommendation>

</ImmunizationProfile>

JSON Equivalent

Example of immunizationprofile

{"ImmunizationProfile": {

"text": {

"status": {"value": "generated"},

"div": "<div>Authored by Joginder Madra<\/div>"

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"recommendation": [{

"vaccineType": {"\_id": "396427003"},

"recommendationDate": {"value": "2013-03-01"},

"forecastStatus": {"value": "DUE"}

}]

}}

## 4.25: Examples: List

Examples for the [List (§3.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#list) resource.

#### 4.25.0.28: General

General List Example

General List Example (id = "example")

<List xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<table>

<thead>

<tr>

<th>**Condition**</th>

<th>**Severity**</th>

<th>**Date**</th>

<th>**Location**</th>

<th>**Status**</th>

</tr>

</thead>

<tbody>

<tr>

<td>**Burnt Ear**</td>

<td>**Severe**</td>

<td>**24-May 2012**</td>

<td>**Left Ear**</td>

<td>**deleted**</td>

</tr>

<tr>

<td>**Asthma**</td>

<td>**Mild**</td>

<td>**21-Nov 2012**</td>

<td>**--**</td>

<td>**added**</td>

</tr>

</tbody>

</table>

</div>

</text>

<!-- This list doesn't have a code. In actual fact,

it's a Condition list produced at the end of an encounter

to a regular primary care practitioner. But the only way

to know this is to hunt down the place it is used

and find out -->

<source>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</source>

<date value="2012-11-25T22:17:00+11:00"/>

<mode value="changes"/>

<entry>

<flag>

<text value="Deleted due to error"/>

</flag>

<deleted value="true"/>

<item>

<type value="[Condition](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition)"/>

<reference value="[condition/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-example)"/>

</item>

</entry>

<entry>

<flag>

<text value="Added"/>

</flag>

<item>

<type value="[Condition](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition)"/>

<reference value="[condition/@example2](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-example2)"/>

</item>

</entry>

</List>

JSON Equivalent

General List Example

{"List": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <table>\n <thead>\n <tr>\n <th>Condition<\/th>\n <th>Severity<\/th>\n <th>Date<\/th>\n <th>Location<\/th>\n <th>Status<\/th>\n <\/tr>\n <\/thead>\n <tbody>\n <tr>\n <td>Burnt Ear<\/td>\n <td>Severe<\/td>\n <td>24-May 2012<\/td>\n <td>Left Ear<\/td>\n <td>deleted<\/td>\n <\/tr>\n <tr>\n <td>Asthma<\/td>\n <td>Mild<\/td>\n <td>21-Nov 2012<\/td>\n <td>--<\/td>\n <td>added<\/td>\n <\/tr>\n <\/tbody>\n <\/table>\n <\/div>"

},

"source": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"entry": [

{

"flag": [{"text": {"value": "Deleted due to error"}}],

"item": {

"type": {"value": "Condition"},

"reference": {"value": "condition/@example"}

},

"deleted": {"value": "true"}

},

{

"flag": [{"text": {"value": "Added"}}],

"item": {

"type": {"value": "Condition"},

"reference": {"value": "condition/@example2"}

}

}

],

"date": {"value": "2012-11-25T22:17:00+11:00"},

"mode": {"value": "changes"}

}}

#### 4.25.0.29: Empty List

Empty List Example

Empty List Example (id = "example-empty")

<List xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**The patient is not on any medications**</p>

</div>

</text>

<code>

<coding>

<system value="http://snomed.info"/>

<code value="182836005"/>

<display value="Review of medication"/>

</coding>

<text value="Medication Review"/>

</code>

<source>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</source>

<date value="2012-11-26T07:30:23+11:00"/>

<mode value="snapshot"/>

<emptyReason>

<coding>

<system value="http://hl7.org/fhir/special-values"/>

<code value="nil known"/>

<display value="Nil Known"/>

</coding>

<text value="The patient is not on any medications"/>

</emptyReason>

</List>

JSON Equivalent

Empty List Example

{"List": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>The patient is not on any medications<\/p>\n <\/div>"

},

"source": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"emptyReason": {

"text": {"value": "The patient is not on any medications"},

"coding": [{

"system": {"value": "http://hl7.org/fhir/special-values"},

"display": {"value": "Nil Known"},

"code": {"value": "nil known"}

}]

},

"code": {

"text": {"value": "Medication Review"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Review of medication"},

"code": {"value": "182836005"}

}]

},

"date": {"value": "2012-11-26T07:30:23+11:00"},

"mode": {"value": "snapshot"}

}}

## 4.26: Examples: Location

Examples for the [Location (§3.22)](http://hl7.org/implement/standards/fhir/fhir-book.htm#location) resource.

#### 4.26.0.30: Wing

Wing within a hospital

Wing within a hospital (id = "1")

<Location xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Burgers UMC, South Wing, second floor**</div>

</text>

<name value="South-2"/>

<description value="South Wing, Floor 2"/>

<type>

<coding>

<system value="http://hl7.org/fhir/location-type"/>

<code value="wi"/>

<display value="Wing"/>

</coding>

</type>

<telecom>

<system value="phone"/>

<value value="2328"/>

</telecom>

<address>

<use value="work"/>

<line value="Galapagosweg 91, Building A"/>

<city value="Den Burg"/>

<zip value="9105 PZ"/>

<country value="NLD"/>

</address>

<position>

<longitude value="4.844614000123024"/>

<latitude value="52.37799399970903"/>

<altitude value="0"/>

</position>

<provider>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@f001](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-f001-burgers)"/>

</provider>

<active value="true"/>

</Location>

JSON Equivalent

Wing within a hospital

{"Location": {

"position": {

"altitude": {"value": "0"},

"longitude": {"value": "4.844614000123024"},

"latitude": {"value": "52.37799399970903"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>Burgers UMC, South Wing, second floor<\/div>"

},

"address": {

"zip": {"value": "9105 PZ"},

"line": [{"value": "Galapagosweg 91, Building A"}],

"use": {"value": "work"},

"country": {"value": "NLD"},

"city": {"value": "Den Burg"}

},

"description": {"value": "South Wing, Floor 2"},

"name": {"value": "South-2"},

"telecom": {

"system": {"value": "phone"},

"value": {"value": "2328"}

},

"active": {"value": "true"},

"provider": {

"type": {"value": "Organization"},

"reference": {"value": "organization/@f001"}

},

"type": [{"coding": [{

"system": {"value": "http://hl7.org/fhir/location-type"},

"display": {"value": "Wing"},

"code": {"value": "wi"}

}]}]

}}

#### 4.26.0.31: Room

Operation room within hospital

Operation room within hospital (id = "2")

<Location xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Burgers UMC, South Wing, second floor, Operation Room 1**</div>

</text>

<name value="South-2-1.00"/>

<description value="South Wing, Floor 2, Operation Room 1"/>

<type>

<coding>

<system value="http://hl7.org/fhir/location-type"/>

<code value="ro"/>

<display value="Room"/>

</coding>

</type>

<telecom>

<system value="phone"/>

<value value="2329"/>

</telecom>

<provider>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@f001](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-f001-burgers)"/>

</provider>

<active value="true"/>

<partOf>

<type value="[Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location)"/>

<reference value="[location/@1](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-example)"/>

</partOf>

</Location>

JSON Equivalent

Operation room within hospital

{"Location": {

"text": {

"status": {"value": "generated"},

"div": "<div>Burgers UMC, South Wing, second floor, Operation Room 1<\/div>"

},

"description": {"value": "South Wing, Floor 2, Operation Room 1"},

"name": {"value": "South-2-1.00"},

"telecom": {

"system": {"value": "phone"},

"value": {"value": "2329"}

},

"partOf": {

"type": {"value": "Location"},

"reference": {"value": "location/@1"}

},

"active": {"value": "true"},

"provider": {

"type": {"value": "Organization"},

"reference": {"value": "organization/@f001"}

},

"type": [{"coding": [{

"system": {"value": "http://hl7.org/fhir/location-type"},

"display": {"value": "Room"},

"code": {"value": "ro"}

}]}]

}}

## 4.27: Examples: Media

Examples for the [Media (§3.23)](http://hl7.org/implement/standards/fhir/fhir-book.htm#media) resource.

#### 4.27.0.32: Plain Photo

Simple photo

Simple photo (id = "example")

<Media xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Diagram for Patient Henry Levin (MRN 12345):**<br/><img alt="diagram" src="#11"/></div>

</text>

<type value="photo"/>

<subtype>

<coding>

<system value="http://hl7.org/fhir/media-method"/>

<code value="diagram"/>

</coding>

</subtype>

<!-- the date this image was created -->

<dateTime value="2009-09-03"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@xcda](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-xcda)"/>

</subject>

<deviceName value="Acme Camera"/>

<height value="145"/>

<width value="126"/>

<content id="a1">

<contentType value="image/gif"/>

<data value="R0lGODlhfgCRAPcAAAAAAIAAAACAAICAAAAAgIAA gACAgICAgMDAwP8AAAD/AP//AAAA//8A/wD///// /wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAAMwAAZgAAmQAAzAAA /wAzAAAzMwAzZgAzmQAzzAAz/wBmAABmMwBmZgBm mQBmzABm/wCZAACZMwCZZgCZmQCZzACZ/wDMAADM MwDMZgDMmQDMzADM/wD/AAD/MwD/ZgD/mQD/zAD/ /zMAADMAMzMAZjMAmTMAzDMA/zMzADMzMzMzZjMz mTMzzDMz/zNmADNmMzNmZjNmmTNmzDNm/zOZADOZ MzOZZjOZmTOZzDOZ/zPMADPMMzPMZjPMmTPMzDPM /zP/ADP/MzP/ZjP/mTP/zDP//2YAAGYAM2YAZmYA mWYAzGYA/2YzAGYzM2YzZmYzmWYzzGYz/2ZmAGZm M2ZmZmZmmWZmzGZm/2aZAGaZM2aZZmaZmWaZzGaZ /2bMAGbMM2bMZmbMmWbMzGbM/2b/AGb/M2b/Zmb/ mWb/zGb//5kAAJkAM5kAZpkAmZkAzJkA/5kzAJkz M5kzZpkzmZkzzJkz/5lmAJlmM5lmZplmmZlmzJlm /5mZAJmZM5mZZpmZmZmZzJmZ/5nMAJnMM5nMZpnM mZnMzJnM/5n/AJn/M5n/Zpn/mZn/zJn//8wAAMwA M8wAZswAmcwAzMwA/8wzAMwzM8wzZswzmcwzzMwz /8xmAMxmM8xmZsxmmcxmzMxm/8yZAMyZM8yZZsyZ mcyZzMyZ/8zMAMzMM8zMZszMmczMzMzM/8z/AMz/ M8z/Zsz/mcz/zMz///8AAP8AM/8AZv8Amf8AzP8A //8zAP8zM/8zZv8zmf8zzP8z//9mAP9mM/9mZv9m mf9mzP9m//+ZAP+ZM/+ZZv+Zmf+ZzP+Z///MAP/M M//MZv/Mmf/MzP/M////AP//M///Zv//mf//zP// /yH5BAEAABAALAAAAAB+AJEAQAj/AP8JHEiwoMGD CBMqXMiwocOHECNKnEixosWLGFHAckaN2jRnsKZh HEmy5EMU0+L5EseNG654KEzKnGkShbN4uFq2xOWR ps+fE5nEy6Wz5a+XQJMqTeisGdGiLuNRi7m0qlJn 06iF7LhxKoqvX2FpnRYSq1eBX62qRYhCKzWzZDeK 3bqR7NSsb99uddZ2r1ZnINuanbrWp82tb8ly/Bjy a1aOKOu+5ZgXZFa7sARzBMl5a9rCJDl29ejxMuDK eb3mJYsSa93GIOW61QgWbEjQGStbrru7o2K3dkXj BUz242WUbj0u9vj1b2KquCn27Rq7I1+9nBkn7gyS K/HBnFd3/y8bUizf6CM76s0qduxp0pvN23UrOnF7 zB7nWiaMXuZhvGJNoxhjpr3G3WMfJfdbgtD1p1Rb xgkHX3uUbeYbdli5dp6DHHbo4YcghijiiCSWeJJG rJloIkoqPeXLNA2q+GFHm+yUSzzxiCQjiG3hVFQu N+74IQry4JSTTjfCImSHyE1TyS9I+iJPZkv21ySE +bE31VTjhZfZfhm2V+VJXLH3WH70MfZVeKfF9Z1i nv3mXldjEiTYmX9tpVhkXrW1JpfX6bVdnosh19xG INVpk3JydafYZjC6RhqMNlHa11u0aQbjl/mVJaB1 McrY16eSSeYle2AmqGp5wIl1KVxj+f8WIDV1/iOY Vote5lt4eZUn6WsI+kZgp6iVxV+tAs064aqUebdr aW55GqZ2AiIWKrIHQahfo3bBeaZ5zq1q17XYMoQl eQt+Jxt56jXrarnwxivvvPTWa++9TJYlGrn4+kdN PJv4kksz92zY709ExqPJkbncw+/BI9mEDy4Mx+MM xD/9+xQ3m+RIK8Yz2STPkS11s8nFIMvEhDw1FoVL xynLdI9KR+bUMMoxR+yML1BxIyWMOY+0kTxQuizV w0E3hOJjBTe9UYO1fZZ0Qlga59hYvgLX3W7GWo20 vLWV5uqjlHZUaVcDbukuZVTe29poqNYnZ2ZzrdbV 0hRmdZh9dX3/raKv5MknG19YVojmVPIJmtlwhBpX bq4V6trd1VhV6t5jfM6XWWVzaRmZ3yO+3WaAi3XG FZfP2vRnYogLp+tec4Ee4qLZ3dfV3XXpHanZMHJV d6WsucprXJiOyaZ+iaH60aJ1JxirRoCF5Wdmfnql J9uUVdma1m7CvTe74mHWLSyNgft6nmaDNSZy5o1m HvPWadW+aN9luVxglpnVeXF6Kxr/88MhX3wcJZsB uS81uDpc+5KDM0VBr3SlAQx1LBSSy1AHT2iSS1u2 E6DYwUtbGTQOacj3mPGg6TeSEZBrWAUnyMzrbVk6 XVyKsxgCwW0/62GMhVKErw12S1D5S0185RQnn8XQ xYUx45NyNOe87gCRPubZj+xeaB+smIl+yllirCho xKmhxExoK1Cv0BSftAVmamhMoxrXyMY2uvGNcIyj HOeoxkXBh44OOZdn8Ggu+DiPjwtJ2CZyUomCTRGO KJFHLljiEnkc8o0Sy0U3WpILoAGSLf9qmc86ckmE /MtHOfEFVjp5EGfc40jieAlgSFmQL27sF/GQx8dY iRaP8EwnL9ERLW1lS5L5whfxyMcubaWworVEHIX0 xzBRcI9NMBJJ9xgmMTW5E19QQ5m0tAlOjOkzeeiS lcwcJFSAeSxSomRjuDT/2y6ncQ9fkMwozMkmVhRW lFTGk5T5sAlgaCawjjWjnJcEYoYWRJU/CUdqbQSX bNYEGRQZjj630qAXO7MmRJ3pOq65DOOiBaqghaVy a4sUcrKYn+ugay+PXFJzgiOesGWISx3sFfRoaEHC qY9ePmzUpCoTnN5JyobF8lx9zJJSEZlqWNK6D0ar taDWsY4zOV2NVj5olq2VVIvCQ1GsjKURBSnnbCJk FbzihxdSqYc1MAyhZZBDPwZ1sKygKiqTHsOqPGFO L8JrX7cgxBmiYk2LagKo9uQ3LKv2zjGcMlbsVLUv I2YRUf+Z5fq2GqzRqO04Z2POlyo4m7KGB3oXsmSd /2Llps7Mh6mVK84FtQW9qllnccLJkFythBgUyo2F AlzTgMIyqECVDkZltSgSB6unZ8Vwc9jZHKUIJ8Ll 8YkvkmLUa3koJPaFdoGeK2Ln9KI6S4GFVMsDV31e M1vQqPZT+uMpcJYY2/V89y9+0tuoKuqp8mhvfKnx 7NNI95fiCIpx1Nmchrj1VbaWtzAOdSLr6MLX+5VH Px+BVIVQdLuXKk8v2pMg69wzFodez0x/Fa+37tQ4 CcbnwAge6Icbg9Ww6gpAALLrXer20mKhuDDGoWlg /Aveq8InizQsjwq7GkQEEVVRsWHQYYIYQ+cFK00G 4o1webxWZEEIsVAEznmH6N1Y4eiUNJaLaRex9UVf wWlSJCRhr+AiZElZsYZoi5xg12eqp3buNEJm3LRQ BcTeSZUx8/pLdk53w9p6CYKE/p+J83NjJuUPeemq 71bbqrjTkTEvjfaQDyFFnXbJr1lshqIKnaja4uHr tWEa4beqRZpJpXcvy3kaxhxD6U/NqaQ0xCr6jJhp FUlYPVl01HrsI8JYPSdpoCXhEG2YUVzrqT2mzpkS KVRAG955u3SJdhITZ766KosyNjQOnZAt6F3d7oQJ +inaJNPrHUXt3fCOt7ylSe962/ve+M63vvkYEAA7"/>

</content>

</Media>

JSON Equivalent

Simple photo

{"Media": {

"content": {

"\_id": "a1",

"data": {"value": ""},

"contentType": {"value": "image/gif"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>Diagram for Patient Henry Levin (MRN 12345):<br/><img alt=\"diagram\" src=\"#11\"/><\/div>"

},

"height": {"value": "145"},

"deviceName": {"value": "Acme Camera"},

"dateTime": {"value": "2009-09-03"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@xcda"}

},

"width": {"value": "126"},

"subtype": {"coding": [{

"system": {"value": "http://hl7.org/fhir/media-method"},

"code": {"value": "diagram"}

}]},

"type": {"value": "photo"}

}}

#### 4.27.0.33: Ultrasound

Example Ultrasound Image

Example Ultrasound Image (id = "1.2.840.11361907579238403408700.3.0.14.19970327150033")

<Media xmlns="http://hl7.org/fhir">

<!--

this is added to demonstrate the use of extensions.

0002,0010 is the DICOM transfer syntax of the referenced image

-->

<extension>

<url value="http://nema.org/fhir/extensions#0002-0010"/>

<valueUri value="urn:oid:1.2.840.10008.1.2.1"/>

</extension>

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

**Ultrasound Image on patient &quot;James Chalmers&quot;:**<br/>

<img alt="WADO reference to image" src="http://imaging.acme.com/wado/server?requestType=WADO&amp;contentType=application%2Fdicom&amp;studyUid=1.2.840.113619.2.21.848.34082.0.538976288.3&amp;seriesUid=1.2.840.113619.2.21.3408.700.0.757923840.3.0&amp;objectUid=1.2.840.11361907579238403408700.3.0.14.19970327150033"/>

</div>

</text>

<type value="photo"/>

<subtype>

<coding>

<system value="http://nema.org/dicom/dcid"/>

<code value="US"/>

</coding>

</subtype>

<identifier>

<use value="official"/>

<label value="InstanceUID"/>

<system value="urn:ietf:rfc:3986"/>

<key value="urn:oid:1.2.840.11361907579238403408700.3.0.14.19970327150033"/>

</identifier>

<identifier>

<label value="accessionNo"/>

<!-- the imaging department accession number. (they recycle numbers each year) -->

<system value="http://acme-imaging.com/accession/2012"/>

<key value="1234567"/>

</identifier>

<identifier>

<label value="studyId"/>

<system value="urn:ietf:rfc:3986"/>

<key value="urn:oid:1.2.840.113619.2.21.848.34082.0.538976288.3"/>

</identifier>

<identifier>

<label value="seriesId"/>

<system value="urn:ietf:rfc:3986"/>

<key value="urn:oid:1.2.840.113619.2.21.3408.700.0.757923840.3.0"/>

</identifier>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<requester>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</requester>

<deviceName value="G.E. Medical Systems"/>

<height value="480"/>

<width value="640"/>

<!-- and a reference to the image data -->

<content>

<contentType value="application/dicom"/>

<!-- The actual image could be anywhere. This is a WADO example -->

<url value="http://imaging.acme.com/wado/server?requestType=WADO&amp;contentType=application%2Fdicom&amp;studyUid=1.2.840.113619.2.21.848.34082.0.538976288.3&amp;seriesUid=1.2.840.113619.2.21.3408.700.0.757923840.3.0&amp;objectUid=1.2.840.11361907579238403408700.3.0.14.19970327150033"/>

</content>

</Media>

JSON Equivalent

Example Ultrasound Image

{"Media": {

"content": {

"contentType": {"value": "application/dicom"},

"url": {"value": "http://imaging.acme.com/wado/server?requestType=WADO&contentType=application%2Fdicom&studyUid=1.2.840.113619.2.21.848.34082.0.538976288.3&seriesUid=1.2.840.113619.2.21.3408.700.0.757923840.3.0&objectUid=1.2.840.11361907579238403408700.3.0.14.19970327150033"}

},

"extension": [{

"valueUri": {"value": "urn:oid:1.2.840.10008.1.2.1"},

"url": {"value": "http://nema.org/fhir/extensions#0002-0010"}

}],

"requester": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>\n Ultrasound Image on patient &quot;James Chalmers&quot;:<br/>\n <img alt=\"WADO reference to image\" src=\"http://imaging.acme.com/wado/server?requestType=WADO&amp;contentType=application%2Fdicom&amp;studyUid=1.2.840.113619.2.21.848.34082.0.538976288.3&amp;seriesUid=1.2.840.113619.2.21.3408.700.0.757923840.3.0&amp;objectUid=1.2.840.11361907579238403408700.3.0.14.19970327150033\"/>\n \n <\/div>"

},

"height": {"value": "480"},

"deviceName": {"value": "G.E. Medical Systems"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"width": {"value": "640"},

"subtype": {"coding": [{

"system": {"value": "http://nema.org/dicom/dcid"},

"code": {"value": "US"}

}]},

"type": {"value": "photo"},

"identifier": [

{

"system": {"value": "urn:ietf:rfc:3986"},

"use": {"value": "official"},

"label": {"value": "InstanceUID"},

"key": {"value": "urn:oid:1.2.840.11361907579238403408700.3.0.14.19970327150033"}

},

{

"system": {"value": "http://acme-imaging.com/accession/2012"},

"label": {"value": "accessionNo"},

"key": {"value": "1234567"}

},

{

"system": {"value": "urn:ietf:rfc:3986"},

"label": {"value": "studyId"},

"key": {"value": "urn:oid:1.2.840.113619.2.21.848.34082.0.538976288.3"}

},

{

"system": {"value": "urn:ietf:rfc:3986"},

"label": {"value": "seriesId"},

"key": {"value": "urn:oid:1.2.840.113619.2.21.3408.700.0.757923840.3.0"}

}

]

}}

## 4.28: Examples: Medication

Examples for the [Medication (§3.24)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication) resource.

#### 4.28.0.34: Penicillin

General Person Example

General Person Example (id = "example")

<Medication xmlns="http://hl7.org/fhir">

<!-- insert contents here -->

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**123456789: Penicillin VK oral suspension 125mg/5ml**</div>

</text>

<name value="Penicillin VK oral suspension 125mg/5ml"/>

<code>

<coding>

<system value="http://snomed.info"/>

<code value="323418000"/>

<display value="Phenoxymethylpenicillin 125mg/5mL oral solution (product)"/>

</coding>

<coding>

<system value="http://nehta.gov.au/amt/v2"/>

<code value="22571011000036102"/>

<display value="phenoxymethylpenicillin 125 mg / 5 mL oral liquid, 5 mL measure"/>

</coding>

</code>

<isBrand value="false"/>

<kind value="product"/>

<product>

<form>

<coding>

<system value="http://snomed.info"/>

<code value="37595005"/>

<display value="Suspension"/>

</coding>

</form>

</product>

</Medication>

JSON Equivalent

General Person Example

{"Medication": {

"product": {"form": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Suspension"},

"code": {"value": "37595005"}

}]}},

"text": {

"status": {"value": "generated"},

"div": "<div>123456789: Penicillin VK oral suspension 125mg/5ml<\/div>"

},

"name": {"value": "Penicillin VK oral suspension 125mg/5ml"},

"isBrand": {"value": "false"},

"code": {"coding": [

{

"system": {"value": "http://snomed.info"},

"display": {"value": "Phenoxymethylpenicillin 125mg/5mL oral solution (product)"},

"code": {"value": "323418000"}

},

{

"system": {"value": "http://nehta.gov.au/amt/v2"},

"display": {"value": "phenoxymethylpenicillin 125 mg / 5 mL oral liquid, 5 mL measure"},

"code": {"value": "22571011000036102"}

}

]},

"kind": {"value": "product"}

}}

## 4.29: Examples: MedicationAdministration

Examples for the [MedicationAdministration (§3.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration) resource.

#### 4.29.0.35: General

Example of medicationadministration

Example of medicationadministration (id = "example")

<MedicationAdministration xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Penicillin VK 10ml suspension administered by oral route at 14:30 on 1 June 2012**</p>

<p>**on the authority of prescription ref: example**</p>

<p>**to patient ref: a23**</p>

</div>

</text>

<!-- -->

<status value="completed"/>

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</patient>

<practitioner>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</practitioner>

<prescription>

<type value="[MedicationPrescription](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription)"/>

<reference value="[medicationprescription/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-example)"/>

</prescription>

<whenGiven>

<start value="2012-06-01T14:30:00"/>

<end value="2012-06-01T14:30:00"/>

</whenGiven>

<medication>

<type value="[Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication)"/>

<reference value="[medication/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-example)"/>

</medication>

<dosage>

<route>

<coding>

<system value="http://snomed.info"/>

<code value="363743006"/>

<display value="oral administration of treatment"/>

</coding>

</route>

<quantity>

<value value="10"/>

<units value="ml"/>

<system value="http://unitsofmeasure.org"/>

<code value="ml"/>

</quantity>

</dosage>

</MedicationAdministration>

JSON Equivalent

Example of medicationadministration

{"MedicationAdministration": {

"medication": {

"type": {"value": "Medication"},

"reference": {"value": "medication/@example"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Penicillin VK 10ml suspension administered by oral route at 14:30 on 1 June 2012<\/p>\n <p>on the authority of prescription ref: example<\/p>\n <p>to patient ref: a23<\/p>\n <\/div>"

},

"patient": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"practitioner": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"prescription": {

"type": {"value": "MedicationPrescription"},

"reference": {"value": "medicationprescription/@example"}

},

"status": {"value": "completed"},

"whenGiven": {

"start": {"value": "2012-06-01T14:30:00"},

"end": {"value": "2012-06-01T14:30:00"}

},

"dosage": [{

"route": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "oral administration of treatment"},

"code": {"value": "363743006"}

}]},

"quantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "10"},

"code": {"value": "ml"},

"units": {"value": "ml"}

}

}]

}}

## 4.30: Examples: MedicationDispense

Examples for the [MedicationDispense (§3.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense) resource.

#### 4.30.0.36: General

Example of medicationdispense

Example of medicationdispense (id = "example")

<MedicationDispense xmlns="http://hl7.org/fhir">

<!-- insert contents here -->

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Penicillin VK 10ml suspension**</p>

<p>**dispensed 16:20 on 30 May 2012**</p>

<p>**by Dr Careful**</p>

<p>**picked up at 10:20 on 31 May 2012**</p>

<p>**on the authority of prescription ref: example**</p>

<p>**to patient ref: a23**</p>

</div>

</text>

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</patient>

<dispenser>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</dispenser>

<authorizingPrescription>

<type value="[MedicationPrescription](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription)"/>

<reference value="[medicationprescription/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-example)"/>

</authorizingPrescription>

<dispense>

<status value="completed"/>

<quantity>

<value value="10"/>

<units value="ml"/>

<system value="http://unitsofmeasure.org"/>

<code value="ml"/>

</quantity>

<medication>

<type value="[Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication)"/>

<reference value="[medication/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-example)"/>

</medication>

<whenPrepared>

<start value="2012-05-30T16:20:00"/>

<end value="2012-05-30T16:20:00"/>

</whenPrepared>

<whenHandedOver>

<start value="2012-05-31T10:20:00"/>

<end value="2012-05-31T10:20:00"/>

</whenHandedOver>

</dispense>

<substitution>

<type>

<coding>

<system value="./MedDispSubType"/>

<code value="NoSub"/>

<display value="No substitution made or expected"/>

</coding>

</type>

</substitution>

</MedicationDispense>

JSON Equivalent

Example of medicationdispense

{"MedicationDispense": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Penicillin VK 10ml suspension<\/p>\n <p>dispensed 16:20 on 30 May 2012<\/p>\n <p>by Dr Careful<\/p>\n <p>picked up at 10:20 on 31 May 2012<\/p>\n <p>on the authority of prescription ref: example<\/p>\n <p>to patient ref: a23<\/p>\n <\/div>"

},

"dispense": [{

"medication": {

"type": {"value": "Medication"},

"reference": {"value": "medication/@example"}

},

"status": {"value": "completed"},

"whenHandedOver": {

"start": {"value": "2012-05-31T10:20:00"},

"end": {"value": "2012-05-31T10:20:00"}

},

"quantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "10"},

"code": {"value": "ml"},

"units": {"value": "ml"}

},

"whenPrepared": {

"start": {"value": "2012-05-30T16:20:00"},

"end": {"value": "2012-05-30T16:20:00"}

}

}],

"patient": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"dispenser": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"substitution": {"type": {"coding": [{

"system": {"value": "./MedDispSubType"},

"display": {"value": "No substitution made or expected"},

"code": {"value": "NoSub"}

}]}},

"authorizingPrescription": [{

"type": {"value": "MedicationPrescription"},

"reference": {"value": "medicationprescription/@example"}

}]

}}

## 4.31: Examples: MedicationPrescription

Examples for the [MedicationPrescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription) resource.

#### 4.31.0.37: Penicillin

General Person Example

General Person Example (id = "example")

<MedicationPrescription xmlns="http://hl7.org/fhir">

<!-- insert contents here -->

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Penicillin VK 5ml suspension to be administered by oral route**</p>

<p>**ONE 5ml spoonful to be taken THREE times a day**</p>

<p>**100ml bottle**</p>

<p>**to patient ref: a23**</p>

<p>**by doctor X**</p>

</div>

</text>

<status value="active"/>

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</patient>

<prescriber>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</prescriber>

<medication>

<type value="[Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication)"/>

<reference value="[medication/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-example)"/>

</medication>

<dosageInstructions>

<timingSchedule>

<repeat>

<frequency value="3"/>

<duration value="1"/>

<units value="d"/>

</repeat>

</timingSchedule>

<route>

<coding>

<system value="http://snomed.info"/>

<code value="363743006"/>

<display value="oral administration of treatment"/>

</coding>

</route>

<doseQuantity>

<value value="5"/>

<units value="ml"/>

<system value="http://unitsofmeasure.org"/>

<code value="ml"/>

</doseQuantity>

</dosageInstructions>

<dispense>

<quantity>

<value value="100"/>

<units value="ml"/>

<system value="http://unitsofmeasure.org"/>

<code value="ml"/>

</quantity>

</dispense>

</MedicationPrescription>

JSON Equivalent

General Person Example

{"MedicationPrescription": {

"medication": {

"type": {"value": "Medication"},

"reference": {"value": "medication/@example"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Penicillin VK 5ml suspension to be administered by oral route<\/p>\n <p>ONE 5ml spoonful to be taken THREE times a day<\/p>\n <p>100ml bottle<\/p>\n <p>to patient ref: a23<\/p>\n <p>by doctor X<\/p>\n <\/div>"

},

"dispense": {"quantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "100"},

"code": {"value": "ml"},

"units": {"value": "ml"}

}},

"patient": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"status": {"value": "active"},

"prescriber": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"dosageInstructions": [{

"timingSchedule": {"repeat": {

"duration": {"value": "1"},

"frequency": {"value": "3"},

"units": {"value": "d"}

}},

"doseQuantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "5"},

"code": {"value": "ml"},

"units": {"value": "ml"}

},

"route": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "oral administration of treatment"},

"code": {"value": "363743006"}

}]}

}]

}}

## 4.32: Examples: MedicationStatement

Examples for the [MedicationStatement (§3.28)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement) resource.

#### 4.32.0.38: General

Example of medicationstatement

Example of medicationstatement (id = "example")

<MedicationStatement xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Penicillin VK 10ml suspension administered by oral route at 14:30 on 1 June 2012**</p>

<p>**to patient ref: a23**</p>

</div>

</text>

<!-- -->

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</patient>

<whenGiven>

<start value="2012-06-01T14:30:00"/>

<end value="2012-06-01T14:30:00"/>

</whenGiven>

<medication>

<type value="[Medication](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication)"/>

<reference value="[medication/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-example)"/>

</medication>

<dosage>

<route>

<coding>

<system value="http://snomed.info"/>

<code value="363743006"/>

<display value="oral administration of treatment"/>

</coding>

</route>

<quantity>

<value value="10"/>

<units value="ml"/>

<system value="http://unitsofmeasure.org"/>

<code value="ml"/>

</quantity>

</dosage>

</MedicationStatement>

JSON Equivalent

Example of medicationstatement

{"MedicationStatement": {

"medication": {

"type": {"value": "Medication"},

"reference": {"value": "medication/@example"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Penicillin VK 10ml suspension administered by oral route at 14:30 on 1 June 2012<\/p>\n <p>to patient ref: a23<\/p>\n <\/div>"

},

"patient": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"whenGiven": {

"start": {"value": "2012-06-01T14:30:00"},

"end": {"value": "2012-06-01T14:30:00"}

},

"dosage": [{

"route": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "oral administration of treatment"},

"code": {"value": "363743006"}

}]},

"quantity": {

"system": {"value": "http://unitsofmeasure.org"},

"value": {"value": "10"},

"code": {"value": "ml"},

"units": {"value": "ml"}

}

}]

}}

## 4.33: Examples: Message

Examples for the [Message (§2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message) resource.

#### 4.33.0.39: General

Example of message

Example of message (id = "example")

<Message xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Update Person resource for Peter James CHALMERS (Jim), MRN: 12345 (Acme Healthcare)**</p>

</div>

</text>

<identifier value="1cbdfb97-5859-48a4-8301-d54eab818d68"/>

<timestamp value="2012-01-04T09:10:14Z"/>

<event value="admin-update"/>

<response>

<identifier value="5015fe84-8e76-4526-89d8-44b322e8d4fb"/>

<code value="ok"/>

</response>

<source>

<name value="Acme Central Patient Registry"/>

<software value="FooBar Patient Manager"/>

<version value="3.1.45.AABB"/>

<contact>

<system value="phone"/>

<value value="+1 (555) 123 4567"/>

</contact>

<endpoint value="llp:10.11.12.13:5432"/>

</source>

<destination>

<name value="Acme Message Gateway"/>

<!-- this is to indicate to the Acme Message Gateway that this particular message

is intended for Practitioner &quot;xcda&quot; -->

<target>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@xcda-author](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example-xcda-author)"/>

</target>

<endpoint value="llp:10.11.12.14:5432"/>

</destination>

<author>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</author>

<!-- Here's the payload, the resource that this admin-update concerns -->

<data>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</data>

</Message>

JSON Equivalent

Example of message

{"Message": {

"response": {

"code": {"value": "ok"},

"identifier": {"value": "5015fe84-8e76-4526-89d8-44b322e8d4fb"}

},

"timestamp": {"value": "2012-01-04T09:10:14Z"},

"author": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Update Person resource for Peter James CHALMERS (Jim), MRN: 12345 (Acme Healthcare)<\/p>\n <\/div>"

},

"source": {

"software": {"value": "FooBar Patient Manager"},

"name": {"value": "Acme Central Patient Registry"},

"contact": {

"system": {"value": "phone"},

"value": {"value": "+1 (555) 123 4567"}

},

"endpoint": {"value": "llp:10.11.12.13:5432"},

"version": {"value": "3.1.45.AABB"}

},

"event": {"value": "admin-update"},

"data": [{

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

}],

"identifier": {"value": "1cbdfb97-5859-48a4-8301-d54eab818d68"},

"destination": {

"name": {"value": "Acme Message Gateway"},

"target": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@xcda-author"}

},

"endpoint": {"value": "llp:10.11.12.14:5432"}

}

}}

## 4.34: Examples: Observation

Examples for the [Observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation) resource.

#### 4.34.0.40: Blood pressure

General Person Example

General Person Example (id = "example")

<Observation xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Sept 17, 2012: Blood pressure 107/65 (normal)**</div>

</text>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="55284-4"/>

<display value="Blood pressure systolic and diastolic"/>

</coding>

</name>

<interpretation>

<coding>

<system value="http://hl7.org/fhir/v2/0078"/>

<code value="N"/>

<display value="Normal (applies to non-numeric results)"/>

</coding>

</interpretation>

<appliesDateTime value="2012-09-17"/>

<status value="final"/>

<reliability value="ok"/>

<identifier>

<system value="urn:ietf:rfc:3986"/>

<key value="187e0c12-8dd2-67e2-99b2-bf273c878281"/>

</identifier>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<performer>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</performer>

<component>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="8480-6"/>

<display value="Systolic blood pressure"/>

</coding>

</name>

<valueQuantity>

<value value="107"/>

<units value="mm[Hg]"/>

</valueQuantity>

</component>

<component>

<name>

<coding>

<system value="http://loinc.org"/>

<code value="8462-4"/>

<display value="Diastolic blood pressure"/>

</coding>

</name>

<valueQuantity>

<value value="65"/>

<units value="mm[Hg]"/>

</valueQuantity>

</component>

</Observation>

JSON Equivalent

General Person Example

{"Observation": {

"text": {

"status": {"value": "generated"},

"div": "<div>Sept 17, 2012: Blood pressure 107/65 (normal)<\/div>"

},

"component": [

{

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Systolic blood pressure"},

"code": {"value": "8480-6"}

}]},

"valueQuantity": {

"value": {"value": "107"},

"units": {"value": "mm[Hg]"}

}

},

{

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Diastolic blood pressure"},

"code": {"value": "8462-4"}

}]},

"valueQuantity": {

"value": {"value": "65"},

"units": {"value": "mm[Hg]"}

}

}

],

"status": {"value": "final"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"name": {"coding": [{

"system": {"value": "http://loinc.org"},

"display": {"value": "Blood pressure systolic and diastolic"},

"code": {"value": "55284-4"}

}]},

"reliability": {"value": "ok"},

"performer": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"interpretation": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v2/0078"},

"display": {"value": "Normal (applies to non-numeric results)"},

"code": {"value": "N"}

}]},

"identifier": {

"system": {"value": "urn:ietf:rfc:3986"},

"key": {"value": "187e0c12-8dd2-67e2-99b2-bf273c878281"}

},

"appliesDateTime": {"value": "2012-09-17"}

}}

## 4.35: Examples: OperationOutcome

Examples for the [OperationOutcome (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) resource.

#### 4.35.0.41: General

General Outcome Example

General Outcome Example (id = "101")

<OperationOutcome xmlns="http://hl7.org/fhir">

<text>

<status value="additional"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**W is not a recognized code for Gender.**</p>

</div>

</text>

<issue>

<severity value="error"/>

<type>

<system value="http://test.org/issueCodeSystem"/>

<code value="V15"/>

<display value="InvalidCode"/>

</type>

<location value="/Person[1]/gender[1]"/>

</issue>

</OperationOutcome>

JSON Equivalent

General Outcome Example

{"OperationOutcome": {

"text": {

"status": {"value": "additional"},

"div": "<div>\n <p>W is not a recognized code for Gender.<\/p>\n <\/div>"

},

"issue": [{

"location": [{"value": "/Person[1]/gender[1]"}],

"severity": {"value": "error"},

"type": {

"system": {"value": "http://test.org/issueCodeSystem"},

"display": {"value": "InvalidCode"},

"code": {"value": "V15"}

}

}]

}}

## 4.36: Examples: Order

Examples for the [Order (§3.31)](http://hl7.org/implement/standards/fhir/fhir-book.htm#order) resource.

#### 4.36.0.42: Order

General example

General example (id = "example")

<Order xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Request for Prescription (on patient Donald DUCK @ Acme Healthcare, Inc. MR = 654321)**</div>

</text>

<date value="2012-12-28T09:03:04+11:00"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@pat2](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-b)"/>

</subject>

<source>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</source>

<reason value="Standard admission testing"/>

<!-- Institution local code meaning &quot;do this today&quot; -->

<when>

<code>

<coding>

<system value="http://acme.com/codes/request-priority"/>

<code value="today"/>

</coding>

</code>

</when>

<detail>

<type value="[MedicationPrescription](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription)"/>

<reference value="[medicationprescription/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription-example)"/>

</detail>

</Order>

JSON Equivalent

General example

{"Order": {

"detail": [{

"type": {"value": "MedicationPrescription"},

"reference": {"value": "medicationprescription/@example"}

}],

"text": {

"status": {"value": "generated"},

"div": "<div>Request for Prescription (on patient Donald DUCK @ Acme Healthcare, Inc. MR = 654321)<\/div>"

},

"source": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"reason": {"value": "Standard admission testing"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@pat2"}

},

"when": {"code": {"coding": [{

"system": {"value": "http://acme.com/codes/request-priority"},

"code": {"value": "today"}

}]}},

"date": {"value": "2012-12-28T09:03:04+11:00"}

}}

## 4.37: Examples: OrderResponse

Examples for the [OrderResponse (§3.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse) resource.

#### 4.37.0.43: General

Example of orderresponse

Example of orderresponse (id = "example")

<OrderResponse xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Lab Report completed at 13:10 28-Dec 2012**</div>

</text>

<!--

this should be a response to the example request,

but we don't yet have all the resource types in

place to make this happen

So for now, although the Order message referred to

here contains a prescription resource, this example

response contains lab reports

-->

<request>

<type value="[Order](http://hl7.org/implement/standards/fhir/fhir-book.htm#order)"/>

<reference value="[order/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-example)"/>

</request>

<date value="2012-12-28T13:10:56+11:00"/>

<!-- made by the lab -->

<who>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@1832473e-2fe0-452d-abe9-3cdb9879522f](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-lab)"/>

</who>

<!--

there's a loose relationship between the status of

the order, and status information on the fulfillment

resources. For instance, in the case of a lab, it probably

wouldn't make sense to claim that the response is anything

but completed when the report is marked as &quot;final&quot; (as it is

in this case). However due to the diversity of business

practices in the order/fulfillment cycle, there's no formal

rules about what is allowed

-->

<code value="complete"/>

<!--

the lab report that the lab provides as a token of its

fulfillment for this order

In the case of a lab order, the report is usually the real/only

outcome. However in a case such as a medication administration,

the actual administration is the fulfillment - the MedicationAdministration

resource is only a token of the fulfillment of the order

-->

<fulfillment>

<type value="[DiagnosticReport](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport)"/>

<reference value="[diagnosticreport/@101](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport-example)"/>

</fulfillment>

</OrderResponse>

JSON Equivalent

Example of orderresponse

{"OrderResponse": {

"text": {

"status": {"value": "generated"},

"div": "<div>Lab Report completed at 13:10 28-Dec 2012<\/div>"

},

"fulfillment": [{

"type": {"value": "DiagnosticReport"},

"reference": {"value": "diagnosticreport/@101"}

}],

"request": {

"type": {"value": "Order"},

"reference": {"value": "order/@example"}

},

"code": {"value": "complete"},

"date": {"value": "2012-12-28T13:10:56+11:00"},

"who": {

"type": {"value": "Organization"},

"reference": {"value": "organization/@1832473e-2fe0-452d-abe9-3cdb9879522f"}

}

}}

## 4.38: Examples: Organization

Examples for the [Organization (§3.33)](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization) resource.

#### 4.38.0.44: HL7

HL7 itself

HL7 itself (id = "hl7")

<Organization xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

**Health Level Seven International**<br/>

**3300 Washtenaw Avenue, Suite 227**<br/>

**Ann Arbor, MI 48104**<br/>

**USA**<br/>

**(+1) 734-677-7777 (phone)**<br/>

**(+1) 734-677-6622 (fax)**<br/>

**E-mail:** <a href="mailto:hq@HL7.org">**hq@HL7.org**</a>

</div>

</text>

<!-- HL7 itself -->

<name value="Health Level Seven International"/>

<telecom>

<system value="phone"/>

<value value="(+1) 734-677-7777"/>

</telecom>

<telecom>

<system value="fax"/>

<value value="(+1) 734-677-6622"/>

</telecom>

<telecom>

<system value="email"/>

<value value="hq@HL7.org"/>

</telecom>

<address>

<line value="3300 Washtenaw Avenue, Suite 227"/>

<city value="Ann Arbor"/>

<state value="MI"/>

<zip value="48104"/>

<country value="USA"/>

</address>

</Organization>

JSON Equivalent

HL7 itself

{"Organization": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n Health Level Seven International<br/>\n\t\t\t\t3300 Washtenaw Avenue, Suite 227<br/>\n\t\t\t\tAnn Arbor, MI 48104<br/>\n\t\t\t\tUSA<br/>\n\t\t\t\t(+1) 734-677-7777 (phone)<br/>\n\t\t\t\t(+1) 734-677-6622 (fax)<br/>\n\t\t\t\tE-mail: <a href=\"mailto:hq@HL7.org\">hq@HL7.org<\/a>\n <\/div>"

},

"address": [{

"zip": {"value": "48104"},

"state": {"value": "MI"},

"line": [{"value": "3300 Washtenaw Avenue, Suite 227"}],

"country": {"value": "USA"},

"city": {"value": "Ann Arbor"}

}],

"name": {"value": "Health Level Seven International"},

"telecom": [

{

"system": {"value": "phone"},

"value": {"value": "(+1) 734-677-7777"}

},

{

"system": {"value": "fax"},

"value": {"value": "(+1) 734-677-6622"}

},

{

"system": {"value": "email"},

"value": {"value": "hq@HL7.org"}

}

]

}}

#### 4.38.0.45: Gastro

Gastroenterology team at ACME Healthcare

Gastroenterology team at ACME Healthcare (id = "1")

<Organization xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Gastroenterology @ Acme Hospital. ph: +1 555 234 3523, email:** <a href="mailto:gastro@acme.org">**gastro@acme.org**</a></p>

</div>

</text>

<!-- Clinical Team &quot;Gastroenterology&quot; at Acme Hospital -->

<identifier>

<system value="http://www.acme.org.au/units"/>

<key value="Gastro"/>

</identifier>

<name value="Gastroenterology"/>

<telecom>

<system value="phone"/>

<value value="+1 555 234 3523"/>

<use value="mobile"/>

</telecom>

<telecom>

<system value="email"/>

<value value="gastro@acme.org"/>

<use value="work"/>

</telecom>

<partOf>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@1](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-gastro)"/>

<display value="ACME Healthcare, Inc"/>

</partOf>

</Organization>

JSON Equivalent

Gastroenterology team at ACME Healthcare

{"Organization": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Gastroenterology @ Acme Hospital. ph: +1 555 234 3523, email: <a href=\"mailto:gastro@acme.org\">gastro@acme.org<\/a><\/p>\n <\/div>"

},

"name": {"value": "Gastroenterology"},

"telecom": [

{

"system": {"value": "phone"},

"value": {"value": "+1 555 234 3523"},

"use": {"value": "mobile"}

},

{

"system": {"value": "email"},

"value": {"value": "gastro@acme.org"},

"use": {"value": "work"}

}

],

"partOf": {

"display": {"value": "ACME Healthcare, Inc"},

"type": {"value": "Organization"},

"reference": {"value": "organization/@1"}

},

"identifier": [{

"system": {"value": "http://www.acme.org.au/units"},

"key": {"value": "Gastro"}

}]

}}

## 4.39: Examples: Patient

Examples for the [Patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient) resource.

#### 4.39.0.46: General

General Person Example

General Person Example (id = "example")

<Patient xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<table>

<tbody>

<tr>

<td>**Name**</td>

<td>**Peter James** <b>**Chalmers**</b> **(&quot;Jim&quot;)**</td>

</tr>

<tr>

<td>**Address**</td>

<td>**534 Erewhon, Pleasantville, Vic, 3999**</td>

</tr>

<tr>

<td>**Contacts**</td>

<td>**Home: unknown. Work: (03) 5555 6473**</td>

</tr>

<tr>

<td>**Id**</td>

<td>**MRN: 12345 (Acme Healthcare)**</td>

</tr>

</tbody>

</table>

</div>

</text>

<!-- MRN assigned by ACME healthcare on 6-May 2001 -->

<identifier>

<use value="usual"/>

<label value="MRN"/>

<system value="urn:oid:1.2.36.146.595.217.0.1"/>

<key value="12345"/>

<period>

<start value="2001-05-06"/>

</period>

<assigner>

<display value="Acme Healthcare"/>

</assigner>

</identifier>

<!-- Peter James Chalmers, but called &quot;Jim&quot; -->

<name>

<use value="official"/>

<family value="Chalmers"/>

<given value="Peter"/>

<given value="James"/>

</name>

<name>

<use value="usual"/>

<given value="Jim"/>

</name>

<telecom>

<use value="home"/>

<!-- home communication details aren't known -->

</telecom>

<telecom>

<system value="phone"/>

<value value="(03) 5555 6473"/>

<use value="work"/>

</telecom>

<!-- use FHIR code system for male / female -->

<gender>

<coding>

<system value="http://hl7.org/fhir/v3/AdministrativeGender"/>

<code value="M"/>

<display value="Male"/>

</coding>

</gender>

<birthDate value="1974-12-25"/>

<deceasedBoolean value="false"/>

<address>

<use value="home"/>

<line value="534 Erewhon St"/>

<city value="PleasantVille"/>

<state value="Vic"/>

<zip value="3999"/>

</address>

<contact>

<relationship>

<coding>

<system value="http://hl7.org/fhir/patient-contact-relationship"/>

<code value="partner"/>

</coding>

</relationship>

<name>

<family value="du">

<!-- the &quot;du&quot; part is a family name prefix (VV in iso 21090) -->

<extension>

<url value="http://hl7.org/fhir/profile/@iso-21090#qualifier"/>

<valueCode value="VV"/>

</extension>

</family>

<family value="Marché"/>

<given value="Bénédicte"/>

</name>

<telecom>

<system value="phone"/>

<value value="+33 (237) 998327"/>

</telecom>

</contact>

<provider>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@1](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-gastro)"/>

</provider>

<active value="true"/>

</Patient>

JSON Equivalent

General Person Example

{"Patient": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <table>\n <tbody>\n <tr>\n <td>Name<\/td>\n <td>Peter James <b>Chalmers<\/b> (&quot;Jim&quot;)<\/td>\n <\/tr>\n <tr>\n <td>Address<\/td>\n <td>534 Erewhon, Pleasantville, Vic, 3999<\/td>\n <\/tr>\n <tr>\n <td>Contacts<\/td>\n <td>Home: unknown. Work: (03) 5555 6473<\/td>\n <\/tr>\n <tr>\n <td>Id<\/td>\n <td>MRN: 12345 (Acme Healthcare)<\/td>\n <\/tr>\n <\/tbody>\n <\/table>\n <\/div>"

},

"address": [{

"zip": {"value": "3999"},

"state": {"value": "Vic"},

"line": [{"value": "534 Erewhon St"}],

"use": {"value": "home"},

"city": {"value": "PleasantVille"}

}],

"name": [

{

"given": [

{"value": "Peter"},

{"value": "James"}

],

"family": [{"value": "Chalmers"}],

"use": {"value": "official"}

},

{

"given": [{"value": "Jim"}],

"use": {"value": "usual"}

}

],

"telecom": [

{"use": {"value": "home"}},

{

"system": {"value": "phone"},

"value": {"value": "(03) 5555 6473"},

"use": {"value": "work"}

}

],

"active": {"value": "true"},

"gender": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v3/AdministrativeGender"},

"display": {"value": "Male"},

"code": {"value": "M"}

}]},

"provider": {

"type": {"value": "Organization"},

"reference": {"value": "organization/@1"}

},

"birthDate": {"value": "1974-12-25"},

"deceasedBoolean": {"value": "false"},

"contact": [{

"relationship": [{"coding": [{

"system": {"value": "http://hl7.org/fhir/patient-contact-relationship"},

"code": {"value": "partner"}

}]}],

"name": {

"given": [{"value": "Bénédicte"}],

"family": [

{

"extension": [{

"valueCode": {"value": "VV"},

"url": {"value": "http://hl7.org/fhir/profile/@iso-21090#qualifier"}

}],

"value": "du"

},

{"value": "Marché"}

]

},

"telecom": [{

"system": {"value": "phone"},

"value": {"value": "+33 (237) 998327"}

}]

}],

"identifier": [{

"system": {"value": "urn:oid:1.2.36.146.595.217.0.1"},

"use": {"value": "usual"},

"label": {"value": "MRN"},

"assigner": {"display": {"value": "Acme Healthcare"}},

"period": {"start": {"value": "2001-05-06"}},

"key": {"value": "12345"}

}]

}}

#### 4.39.0.47: Animal

An example of an animal

An example of an animal (id = "animal")

<Patient xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<table>

<tbody>

<tr>

<td>**Id**</td>

<td>**Kenzi (Dog: Golden Retriever)**</td>

</tr>

<tr>

<td>**Owner**</td>

<td>**Peter Chalmers, 534 Erewhon, Pleasantville, Vic, 3999**</td>

</tr>

<tr>

<td>**Contacts**</td>

<td>**Work: (03) 5555 6473**</td>

</tr>

<tr>

<td>**Id**</td>

<td>**Dog Tag: 1234123 (Maroondah City Council)**</td>

</tr>

</tbody>

</table>

</div>

</text>

<!-- Dog tag, under Maroondah City council -->

<identifier>

<label value="Dog Tag"/>

<system value="http://www.maroondah.vic.gov.au/AnimalRegFees.aspx"/>

<key value="1234123"/>

<period>

<start value="2010-05-31"/>

</period>

<assigner>

<display value="Maroondah City Council"/>

</assigner>

</identifier>

<!-- Dog's name: Kenzi -->

<name>

<use value="usual"/>

<given value="Kenzi"/>

</name>

<gender>

<coding>

<system value="http://hl7.org/fhir/v3/AdministrativeGender"/>

<code value="F"/>

</coding>

</gender>

<birthDate value="2010-03-23"/>

<contact>

<relationship>

<coding>

<system value="http://hl7.org/fhir/patient-contact-relationship"/>

<code value="owner"/>

</coding>

</relationship>

<name>

<family value="Chalmers"/>

<given value="Peter"/>

<given value="James"/>

</name>

<telecom>

<system value="phone"/>

<value value="(03) 5555 6473"/>

<use value="work"/>

</telecom>

</contact>

<animal>

<species>

<coding>

<system value="http://hl7.org/fhir/animal-species"/>

<code value="canislf"/>

<display value="Dog"/>

</coding>

</species>

<breed>

<coding>

<system value="http://snomed.info"/>

<code value="58108001"/>

<display value="Golden retriever"/>

</coding>

<coding>

<system value="http://hl7.org/fhir/animal-breed"/>

<code value="gret"/>

<display value="Golden Retriever"/>

</coding>

</breed>

<genderStatus>

<coding>

<system value="http://hl7.org/fhir/animal-genderstatus"/>

<code value="neutered"/>

</coding>

</genderStatus>

</animal>

<provider>

<display value="Pete's Veterinary Services"/>

</provider>

<active value="true"/>

</Patient>

JSON Equivalent

An example of an animal

{"Patient": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <table>\n <tbody>\n <tr>\n <td>Id<\/td>\n <td>Kenzi (Dog: Golden Retriever)<\/td>\n <\/tr>\n <tr>\n <td>Owner<\/td>\n <td>Peter Chalmers, 534 Erewhon, Pleasantville, Vic, 3999<\/td>\n <\/tr>\n <tr>\n <td>Contacts<\/td>\n <td>Work: (03) 5555 6473<\/td>\n <\/tr>\n <tr>\n <td>Id<\/td>\n <td>Dog Tag: 1234123 (Maroondah City Council)<\/td>\n <\/tr>\n <\/tbody>\n <\/table>\n <\/div>"

},

"name": [{

"given": [{"value": "Kenzi"}],

"use": {"value": "usual"}

}],

"active": {"value": "true"},

"gender": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v3/AdministrativeGender"},

"code": {"value": "F"}

}]},

"provider": {"display": {"value": "Pete's Veterinary Services"}},

"birthDate": {"value": "2010-03-23"},

"contact": [{

"relationship": [{"coding": [{

"system": {"value": "http://hl7.org/fhir/patient-contact-relationship"},

"code": {"value": "owner"}

}]}],

"name": {

"given": [

{"value": "Peter"},

{"value": "James"}

],

"family": [{"value": "Chalmers"}]

},

"telecom": [{

"system": {"value": "phone"},

"value": {"value": "(03) 5555 6473"},

"use": {"value": "work"}

}]

}],

"identifier": [{

"system": {"value": "http://www.maroondah.vic.gov.au/AnimalRegFees.aspx"},

"label": {"value": "Dog Tag"},

"assigner": {"display": {"value": "Maroondah City Council"}},

"period": {"start": {"value": "2010-05-31"}},

"key": {"value": "1234123"}

}],

"animal": {

"breed": {"coding": [

{

"system": {"value": "http://snomed.info"},

"display": {"value": "Golden retriever"},

"code": {"value": "58108001"}

},

{

"system": {"value": "http://hl7.org/fhir/animal-breed"},

"display": {"value": "Golden Retriever"},

"code": {"value": "gret"}

}

]},

"genderStatus": {"coding": [{

"system": {"value": "http://hl7.org/fhir/animal-genderstatus"},

"code": {"value": "neutered"}

}]},

"species": {"coding": [{

"system": {"value": "http://hl7.org/fhir/animal-species"},

"display": {"value": "Dog"},

"code": {"value": "canislf"}

}]}

}

}}

## 4.40: Examples: Picture

Examples for the [Picture (§3.35)](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture) resource.

#### 4.40.0.48: Plain Photo

Simple photo

Simple photo (id = "example")

<Picture xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Diagram for Patient Henry Levin (MRN 12345):**<br/><img alt="diagram" src="#11"/></div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@xcda](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-xcda)"/>

</subject>

<!-- the date this image was created -->

<dateTime value="2009-09-03"/>

<!-- diagram -->

<modality value="DIA"/>

<deviceName value="Acme Imaging NX-333"/>

<height value="145"/>

<width value="126"/>

<bits value="8"/>

<frames value="1"/>

<content id="a1">

<contentType value="image/gif"/>

<data value="R0lGODlhfgCRAPcAAAAAAIAAAACAAICAAAAAgIAA gACAgICAgMDAwP8AAAD/AP//AAAA//8A/wD///// /wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAAMwAAZgAAmQAAzAAA /wAzAAAzMwAzZgAzmQAzzAAz/wBmAABmMwBmZgBm mQBmzABm/wCZAACZMwCZZgCZmQCZzACZ/wDMAADM MwDMZgDMmQDMzADM/wD/AAD/MwD/ZgD/mQD/zAD/ /zMAADMAMzMAZjMAmTMAzDMA/zMzADMzMzMzZjMz mTMzzDMz/zNmADNmMzNmZjNmmTNmzDNm/zOZADOZ MzOZZjOZmTOZzDOZ/zPMADPMMzPMZjPMmTPMzDPM /zP/ADP/MzP/ZjP/mTP/zDP//2YAAGYAM2YAZmYA mWYAzGYA/2YzAGYzM2YzZmYzmWYzzGYz/2ZmAGZm M2ZmZmZmmWZmzGZm/2aZAGaZM2aZZmaZmWaZzGaZ /2bMAGbMM2bMZmbMmWbMzGbM/2b/AGb/M2b/Zmb/ mWb/zGb//5kAAJkAM5kAZpkAmZkAzJkA/5kzAJkz M5kzZpkzmZkzzJkz/5lmAJlmM5lmZplmmZlmzJlm /5mZAJmZM5mZZpmZmZmZzJmZ/5nMAJnMM5nMZpnM mZnMzJnM/5n/AJn/M5n/Zpn/mZn/zJn//8wAAMwA M8wAZswAmcwAzMwA/8wzAMwzM8wzZswzmcwzzMwz /8xmAMxmM8xmZsxmmcxmzMxm/8yZAMyZM8yZZsyZ mcyZzMyZ/8zMAMzMM8zMZszMmczMzMzM/8z/AMz/ M8z/Zsz/mcz/zMz///8AAP8AM/8AZv8Amf8AzP8A //8zAP8zM/8zZv8zmf8zzP8z//9mAP9mM/9mZv9m mf9mzP9m//+ZAP+ZM/+ZZv+Zmf+ZzP+Z///MAP/M M//MZv/Mmf/MzP/M////AP//M///Zv//mf//zP// /yH5BAEAABAALAAAAAB+AJEAQAj/AP8JHEiwoMGD CBMqXMiwocOHECNKnEixosWLGFHAckaN2jRnsKZh HEmy5EMU0+L5EseNG654KEzKnGkShbN4uFq2xOWR ps+fE5nEy6Wz5a+XQJMqTeisGdGiLuNRi7m0qlJn 06iF7LhxKoqvX2FpnRYSq1eBX62qRYhCKzWzZDeK 3bqR7NSsb99uddZ2r1ZnINuanbrWp82tb8ly/Bjy a1aOKOu+5ZgXZFa7sARzBMl5a9rCJDl29ejxMuDK eb3mJYsSa93GIOW61QgWbEjQGStbrru7o2K3dkXj BUz242WUbj0u9vj1b2KquCn27Rq7I1+9nBkn7gyS K/HBnFd3/y8bUizf6CM76s0qduxp0pvN23UrOnF7 zB7nWiaMXuZhvGJNoxhjpr3G3WMfJfdbgtD1p1Rb xgkHX3uUbeYbdli5dp6DHHbo4YcghijiiCSWeJJG rJloIkoqPeXLNA2q+GFHm+yUSzzxiCQjiG3hVFQu N+74IQry4JSTTjfCImSHyE1TyS9I+iJPZkv21ySE +bE31VTjhZfZfhm2V+VJXLH3WH70MfZVeKfF9Z1i nv3mXldjEiTYmX9tpVhkXrW1JpfX6bVdnosh19xG INVpk3JydafYZjC6RhqMNlHa11u0aQbjl/mVJaB1 McrY16eSSeYle2AmqGp5wIl1KVxj+f8WIDV1/iOY Vote5lt4eZUn6WsI+kZgp6iVxV+tAs064aqUebdr aW55GqZ2AiIWKrIHQahfo3bBeaZ5zq1q17XYMoQl eQt+Jxt56jXrarnwxivvvPTWa++9TJYlGrn4+kdN PJv4kksz92zY709ExqPJkbncw+/BI9mEDy4Mx+MM xD/9+xQ3m+RIK8Yz2STPkS11s8nFIMvEhDw1FoVL xynLdI9KR+bUMMoxR+yML1BxIyWMOY+0kTxQuizV w0E3hOJjBTe9UYO1fZZ0Qlga59hYvgLX3W7GWo20 vLWV5uqjlHZUaVcDbukuZVTe29poqNYnZ2ZzrdbV 0hRmdZh9dX3/raKv5MknG19YVojmVPIJmtlwhBpX bq4V6trd1VhV6t5jfM6XWWVzaRmZ3yO+3WaAi3XG FZfP2vRnYogLp+tec4Ee4qLZ3dfV3XXpHanZMHJV d6WsucprXJiOyaZ+iaH60aJ1JxirRoCF5Wdmfnql J9uUVdma1m7CvTe74mHWLSyNgft6nmaDNSZy5o1m HvPWadW+aN9luVxglpnVeXF6Kxr/88MhX3wcJZsB uS81uDpc+5KDM0VBr3SlAQx1LBSSy1AHT2iSS1u2 E6DYwUtbGTQOacj3mPGg6TeSEZBrWAUnyMzrbVk6 XVyKsxgCwW0/62GMhVKErw12S1D5S0185RQnn8XQ xYUx45NyNOe87gCRPubZj+xeaB+smIl+yllirCho xKmhxExoK1Cv0BSftAVmamhMoxrXyMY2uvGNcIyj HOeoxkXBh44OOZdn8Ggu+DiPjwtJ2CZyUomCTRGO KJFHLljiEnkc8o0Sy0U3WpILoAGSLf9qmc86ckmE /MtHOfEFVjp5EGfc40jieAlgSFmQL27sF/GQx8dY iRaP8EwnL9ERLW1lS5L5whfxyMcubaWworVEHIX0 xzBRcI9NMBJJ9xgmMTW5E19QQ5m0tAlOjOkzeeiS lcwcJFSAeSxSomRjuDT/2y6ncQ9fkMwozMkmVhRW lFTGk5T5sAlgaCawjjWjnJcEYoYWRJU/CUdqbQSX bNYEGRQZjj630qAXO7MmRJ3pOq65DOOiBaqghaVy a4sUcrKYn+ugay+PXFJzgiOesGWISx3sFfRoaEHC qY9ePmzUpCoTnN5JyobF8lx9zJJSEZlqWNK6D0ar taDWsY4zOV2NVj5olq2VVIvCQ1GsjKURBSnnbCJk FbzihxdSqYc1MAyhZZBDPwZ1sKygKiqTHsOqPGFO L8JrX7cgxBmiYk2LagKo9uQ3LKv2zjGcMlbsVLUv I2YRUf+Z5fq2GqzRqO04Z2POlyo4m7KGB3oXsmSd /2Llps7Mh6mVK84FtQW9qllnccLJkFythBgUyo2F AlzTgMIyqECVDkZltSgSB6unZ8Vwc9jZHKUIJ8Ll 8YkvkmLUa3koJPaFdoGeK2Ln9KI6S4GFVMsDV31e M1vQqPZT+uMpcJYY2/V89y9+0tuoKuqp8mhvfKnx 7NNI95fiCIpx1Nmchrj1VbaWtzAOdSLr6MLX+5VH Px+BVIVQdLuXKk8v2pMg69wzFodez0x/Fa+37tQ4 CcbnwAge6Icbg9Ww6gpAALLrXer20mKhuDDGoWlg /Aveq8InizQsjwq7GkQEEVVRsWHQYYIYQ+cFK00G 4o1webxWZEEIsVAEznmH6N1Y4eiUNJaLaRex9UVf wWlSJCRhr+AiZElZsYZoi5xg12eqp3buNEJm3LRQ BcTeSZUx8/pLdk53w9p6CYKE/p+J83NjJuUPeemq 71bbqrjTkTEvjfaQDyFFnXbJr1lshqIKnaja4uHr tWEa4beqRZpJpXcvy3kaxhxD6U/NqaQ0xCr6jJhp FUlYPVl01HrsI8JYPSdpoCXhEG2YUVzrqT2mzpkS KVRAG955u3SJdhITZ766KosyNjQOnZAt6F3d7oQJ +inaJNPrHUXt3fCOt7ylSe962/ve+M63vvkYEAA7"/>

</content>

</Picture>

JSON Equivalent

Simple photo

{"Picture": {

"content": {

"\_id": "a1",

"data": {"value": ""},

"contentType": {"value": "image/gif"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>Diagram for Patient Henry Levin (MRN 12345):<br/><img alt=\"diagram\" src=\"#11\"/><\/div>"

},

"height": {"value": "145"},

"deviceName": {"value": "Acme Imaging NX-333"},

"frames": {"value": "1"},

"dateTime": {"value": "2009-09-03"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@xcda"}

},

"bits": {"value": "8"},

"width": {"value": "126"},

"modality": {"value": "DIA"}

}}

#### 4.40.0.49: Ultrasound

Example Ultrasound Image

Example Ultrasound Image (id = "1.2.840.11361907579238403408700.3.0.14.19970327150033")

<Picture xmlns="http://hl7.org/fhir">

<!--

this is added to demonstrate the use of extensions.

0002,0010 is the DICOM transfer syntax of the referenced image

-->

<extension>

<url value="http://nema.org/fhir/extensions#0002-0010"/>

<valueUri value="urn:oid:1.2.840.10008.1.2.1"/>

</extension>

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

**Ultrasound Image on patient &quot;James Chalmers&quot;:**<br/>

<img alt="WADO reference to image" src="http://imaging.acme.com/wado/server?requestType=WADO&amp;contentType=application%2Fdicom&amp;studyUid=1.2.840.113619.2.21.848.34082.0.538976288.3&amp;seriesUid=1.2.840.113619.2.21.3408.700.0.757923840.3.0&amp;objectUid=1.2.840.11361907579238403408700.3.0.14.19970327150033"/>

</div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<identifier>

<label value="InstanceUID"/>

<system value="urn:ietf:rfc:3986"/>

<key value="urn:oid:1.2.840.11361907579238403408700.3.0.14.19970327150033"/>

</identifier>

<!-- the imaging department accession number. (they recycle numbers each year) -->

<accessionNo>

<system value="http://acme-imaging.com/accession/2012"/>

<key value="1234567"/>

</accessionNo>

<studyId>

<system value="urn:ietf:rfc:3986"/>

<key value="urn:oid:1.2.840.113619.2.21.848.34082.0.538976288.3"/>

</studyId>

<seriesId>

<system value="urn:ietf:rfc:3986"/>

<key value="urn:oid:1.2.840.113619.2.21.3408.700.0.757923840.3.0"/>

</seriesId>

<requester>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

</requester>

<modality value="US"/>

<deviceName value="G.E. Medical Systems"/>

<height value="480"/>

<width value="640"/>

<bits value="2"/>

<frames value="1"/>

<!-- and a reference to the image data -->

<content>

<contentType value="application/dicom"/>

<!-- The actual image could be anywhere. This is a WADO example -->

<url value="http://imaging.acme.com/wado/server?requestType=WADO&amp;contentType=application%2Fdicom&amp;studyUid=1.2.840.113619.2.21.848.34082.0.538976288.3&amp;seriesUid=1.2.840.113619.2.21.3408.700.0.757923840.3.0&amp;objectUid=1.2.840.11361907579238403408700.3.0.14.19970327150033"/>

</content>

</Picture>

JSON Equivalent

Example Ultrasound Image

{"Picture": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n Ultrasound Image on patient &quot;James Chalmers&quot;:<br/>\n <img alt=\"WADO reference to image\" src=\"http://imaging.acme.com/wado/server?requestType=WADO&amp;contentType=application%2Fdicom&amp;studyUid=1.2.840.113619.2.21.848.34082.0.538976288.3&amp;seriesUid=1.2.840.113619.2.21.3408.700.0.757923840.3.0&amp;objectUid=1.2.840.11361907579238403408700.3.0.14.19970327150033\"/>\n \n <\/div>"

},

"requester": {

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"width": {"value": "640"},

"content": {

"contentType": {"value": "application/dicom"},

"url": {"value": "http://imaging.acme.com/wado/server?requestType=WADO&contentType=application%2Fdicom&studyUid=1.2.840.113619.2.21.848.34082.0.538976288.3&seriesUid=1.2.840.113619.2.21.3408.700.0.757923840.3.0&objectUid=1.2.840.11361907579238403408700.3.0.14.19970327150033"}

},

"extension": [{

"valueUri": {"value": "urn:oid:1.2.840.10008.1.2.1"},

"url": {"value": "http://nema.org/fhir/extensions#0002-0010"}

}],

"accessionNo": {

"system": {"value": "http://acme-imaging.com/accession/2012"},

"key": {"value": "1234567"}

},

"height": {"value": "480"},

"deviceName": {"value": "G.E. Medical Systems"},

"frames": {"value": "1"},

"studyId": {

"system": {"value": "urn:ietf:rfc:3986"},

"key": {"value": "urn:oid:1.2.840.113619.2.21.848.34082.0.538976288.3"}

},

"bits": {"value": "2"},

"modality": {"value": "US"},

"identifier": {

"system": {"value": "urn:ietf:rfc:3986"},

"label": {"value": "InstanceUID"},

"key": {"value": "urn:oid:1.2.840.11361907579238403408700.3.0.14.19970327150033"}

},

"seriesId": {

"system": {"value": "urn:ietf:rfc:3986"},

"key": {"value": "urn:oid:1.2.840.113619.2.21.3408.700.0.757923840.3.0"}

}

}}

## 4.41: Examples: Practitioner

Examples for the [Practitioner (§3.36)](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner) resource.

#### 4.41.0.50: General

General Person Example

General Person Example (id = "example")

<Practitioner xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Dr Adam Careful is a Referring Practitioner for Acme Hospital from 1-Jan 2012 to 31-Mar**

**2012**</p>

</div>

</text>

<identifier>

<system value="http://www.acme.org/practitioners"/>

<key value="23"/>

</identifier>

<name>

<family value="Careful"/>

<given value="Adam"/>

<prefix value="Dr"/>

</name>

<organization>

<type value="[Organization](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization)"/>

<reference value="[organization/@1](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization-example-gastro)"/>

</organization>

<!-- Referring Practitioner for the first 3 months of 2012 -->

<role>

<coding>

<system value="http://hl7.org/fhir/v2/0286"/>

<code value="RP"/>

</coding>

</role>

<period>

<start value="2012-01-01"/>

<end value="2012-03-31"/>

</period>

</Practitioner>

JSON Equivalent

General Person Example

{"Practitioner": {

"organization": {

"type": {"value": "Organization"},

"reference": {"value": "organization/@1"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Dr Adam Careful is a Referring Practitioner for Acme Hospital from 1-Jan 2012 to 31-Mar\n 2012<\/p>\n <\/div>"

},

"name": {

"given": [{"value": "Adam"}],

"family": [{"value": "Careful"}],

"prefix": [{"value": "Dr"}]

},

"role": [{"coding": [{

"system": {"value": "http://hl7.org/fhir/v2/0286"},

"code": {"value": "RP"}

}]}],

"period": {

"start": {"value": "2012-01-01"},

"end": {"value": "2012-03-31"}

},

"identifier": [{

"system": {"value": "http://www.acme.org/practitioners"},

"key": {"value": "23"}

}]

}}

## 4.42: Examples: Procedure

Examples for the [Procedure (§3.37)](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure) resource.

#### 4.42.0.51: General

General Procedure Example

General Procedure Example (id = "example")

<Procedure xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Routine appendectomy**</div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<type>

<coding>

<system value="http://snomed.info"/>

<code value="80146002"/>

<display value="Appendectomy (Procedure)"/>

</coding>

<text value="Appendectomy"/>

</type>

<indication value="Generalized abdominal pain 24 hours. Localized in RIF with rebound and guarding"/>

<performer>

<person>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

<display value="Dr Cyril Surgeon"/>

</person>

</performer>

<date>

<start value="2013-04-05"/>

</date>

<followUp value="ROS 5 days - 2013-04-10"/>

<notes value="Routine Appendectomy. Appendix was inflamed and in retro-caecal position"/>

</Procedure>

JSON Equivalent

General Procedure Example

{"Procedure": {

"text": {

"status": {"value": "generated"},

"div": "<div>Routine appendectomy<\/div>"

},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"indication": {"value": "Generalized abdominal pain 24 hours. Localized in RIF with rebound and guarding"},

"performer": [{"person": {

"display": {"value": "Dr Cyril Surgeon"},

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

}}],

"notes": {"value": "Routine Appendectomy. Appendix was inflamed and in retro-caecal position"},

"date": {"start": {"value": "2013-04-05"}},

"type": {

"text": {"value": "Appendectomy"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Appendectomy (Procedure)"},

"code": {"value": "80146002"}

}]

},

"followUp": {"value": "ROS 5 days - 2013-04-10"}

}}

#### 4.42.0.52: Biopsy

Example of a Biopsy

Example of a Biopsy (id = "biopsy")

<Procedure xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Biopsy of suspected melanoma L) arm**</div>

</text>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</subject>

<type>

<coding>

<system value="http://snomed.info"/>

<code value="90105005"/>

<display value="Biopsy of soft tissue of forearm (Procedure)"/>

</coding>

<text value="Biopsy of suspected melanoma L) arm"/>

</type>

<bodySite>

<coding>

<system value="http://snomed.info"/>

<code value="368225008"/>

<display value="Entire Left Forearm"/>

</coding>

<text value="Left forearm"/>

</bodySite>

<indication value="Dark lesion l) forearm. getting darker last 3 months."/>

<performer>

<person>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="[practitioner/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner-example)"/>

<display value="Dr Bert Biopser"/>

</person>

</performer>

<date>

<start value="2014-02-03"/>

</date>

<followUp value="Review in clinic"/>

<notes value="Standard Biopsy"/>

</Procedure>

JSON Equivalent

Example of a Biopsy

{"Procedure": {

"text": {

"status": {"value": "generated"},

"div": "<div>Biopsy of suspected melanoma L) arm<\/div>"

},

"bodySite": [{

"text": {"value": "Left forearm"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Entire Left Forearm"},

"code": {"value": "368225008"}

}]

}],

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"indication": {"value": "Dark lesion l) forearm. getting darker last 3 months."},

"performer": [{"person": {

"display": {"value": "Dr Bert Biopser"},

"type": {"value": "Practitioner"},

"reference": {"value": "practitioner/@example"}

}}],

"notes": {"value": "Standard Biopsy"},

"date": {"start": {"value": "2014-02-03"}},

"type": {

"text": {"value": "Biopsy of suspected melanoma L) arm"},

"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Biopsy of soft tissue of forearm (Procedure)"},

"code": {"value": "90105005"}

}]

},

"followUp": {"value": "Review in clinic"}

}}

## 4.43: Examples: Profile

Examples for the [Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) resource.

#### 4.43.0.53: General

General Profile Example

General Profile Example (id = "101")

<Profile xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<pre>

**&lt;**<a class="dict" href="#DiagnosticReport" title="The findings and interpretation of a general lipid lab profile">

<b>**DiagnosticReport**</b>

**(Sample, never intended for real use)**<br/>

</a> **xmlns=&quot;http://hl7.org/fhir&quot;&gt;**

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.id" title="Master Resource Id, always first in all resources">

<b>**id**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#id">**id**</a>

</span>

<span style="color: navy">**Master Resource Id, always first in all resources**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/id&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.status" title="The status of the pathology test result as a whole">

<b>**status**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#code">**code**</a>

</span>

<span style="color: navy">**registered|interim|final|amended|cancelled|withdrawn**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/status&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.issued" title="The date and/or time that the result was issued from the source for the recorded â€˜Test result status">

<b>**issued**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#instant">**instant**</a>

</span>

<span style="color: navy">**date issued for current status**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/issued&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.patient" title="The patient about who the report is about">

<b>**patient**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="resources.htm#Resource">**Resource**</a>**(**<a href="Patient.htm#Patient">**Patient**</a>**)**</span>

<span style="color: navy">**The patient the report is about**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/patient&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.admission" title="The admission that this diagnostic investigation is associated with">

<b>**admission**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="resources.htm#Resource">**Resource**</a>**(**<a href="Admission.htm#Admission">**Admission**</a>**)**</span>

<span style="color: navy">**Admission Context**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/admission&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.laboratory" title="The laboratory service that issued the report">

<b>**laboratory**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="resources.htm#Resource">**Resource**</a>**(**<a href="Organization.htm#Organization">**Organization**</a>**)**</span>

<span style="color: navy">**Responsible Laboratory**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/laboratory&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.reportId" title="The local ID assigned to the report by the order filler, usually by the Laboratory Information System (LIS).">

<b>**reportId**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#Identifier">**Identifier**</a>

</span>

<span style="color: navy">**Id for external references to this report**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/reportId&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.requestDetail" title="Details concerning a single pathology test requested.">

<b>**requestDetail**</b>

</a>**&gt;** <span style="color: Gray">**&lt;!--** <span style="color: brown">

<b>**0..\***</b>

</span> **What was requested --&gt;**</span>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.requestDetail.requestOrderId" title="The local ID assigned to the order by the order requester.">

<b>**requestOrderId**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#Identifier">**Identifier**</a>

</span>

<span style="color: navy">**Id assigned by requester**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/requestOrderId&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.requestDetail.receiverOrderId" title="The local ID assigned to the test order by the order filler, usually by the Laboratory Information System (LIS).">

<b>**receiverOrderId**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#Identifier">**Identifier**</a>

</span>

<span style="color: navy">**Receiver's Id for the request**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/receiverOrderId&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.requestDetail.requestTest" title="Identification of pathology test requested,">

<b>**requestTest**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..\***</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**Test Requested**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/requestTest&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.requestDetail.requester" title="Details of the clinician or organization requesting the laboratory test.">

<b>**requester**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="resources.htm#Resource">**Resource**</a>**(**<a href="Practitioner.htm#Practitioner">**Practitioner**</a>**|**<a href="Organization.htm#Organization">**Organization**</a>**)**</span>

<span style="color: navy">**Responsible for request**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/requester&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.requestDetail.clinicalInfo" title="Details of the clinical information provided to the laboratory along with the original request">

<b>**clinicalInfo**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="resources.htm#Resource">**Resource**</a>**(**<a href="Any.htm#Any">**Any**</a>**)**</span>

<span style="color: navy">**Clinical information provided**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/clinicalInfo&gt;**</i>

**&lt;/requestDetail&gt;**</i>

**&lt;**<a class="dict" href="#DiagnosticReport.reportName" title="LOINC Code for Lipid Report with LDL (this element must be supported or understood)">

<span style="text-decoration: underline">**reportName**</span>

</a>**&gt;**

**&lt;coding&gt;**

**&lt;code&gt;57698-3&lt;/code&gt;**

**&lt;system&gt;http://LOINC.org&lt;/system&gt;**

**&lt;display&gt;Lipid panel with direct LDL&lt;/display&gt;**

**&lt;/coding&gt;**

**&lt;reportName/&gt;**

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.service" title="The diagnostic service that performs the examination e.g. biochemistry, hematology.">

<b>**service**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**Biochemistry, Hematology, etc.**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/service&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.diagnosticTime" title="The diagnostically relevant time for this report">

<b>**diagnosticTime**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#dateTime">**dateTime**</a>

</span>

<span style="color: navy">**Effective time of diagnostic report**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/diagnosticTime&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.specimen" title="Details about the specimen if all individual test results are derived from the same specimen">

<b>**specimen**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..\***</b>

</span>

<span style="color: darkgreen">

<a href="resources.htm#Resource">**Resource**</a>**(**<a href="Specimen.htm#Specimen">**Specimen**</a>**)**</span>

<span style="color: navy">**Specimen (incl. time of collection)**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/specimen&gt;**</i>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup" title="All the lipid panel results (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**resultGroup**</b>

</span>

</a>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.name" title="No name needed for the result group (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**name**</b>

</span>

</a>

<span style="color: brown">

<b>**0..0**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**No name needed for the result group**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/name&gt;**

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.specimen" title="Details about the individual specimen to which these â€˜Result groupâ€™ test results refer, where testing of multiple specimens is required.">

<b>**specimen**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="resources.htm#Resource">**Resource**</a>**(**<a href="Specimen.htm#Specimen">**Specimen**</a>**)**</span>

<span style="color: navy">**Specimen details**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/specimen&gt;**</i>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result" title="Group of elements for Cholesterol result (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**result**</b>

</span>

</a>

<span style="color: blue">**&quot;Cholesterol Group&quot;**</span>

<span style="color: Gray"> **--&gt;**</span>

<span style="color: Gray">**&lt;!-- Cholesterol Result --&gt;**</span>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.name" title="Cholesterol (this element must be supported or understood)">

<span style="text-decoration: underline">**name**</span>

</a>**&gt;**

**&lt;coding&gt;**

**&lt;code&gt;35200-5&lt;/code&gt;**

**&lt;system&gt;http://LOINC.org&lt;/system&gt;**

**&lt;display&gt;Cholesterol&lt;/display&gt;**

**&lt;/coding&gt;**

**&lt;name/&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.valueQuantity" title="Cholesterol value. If a result is not available, use the comments field (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**valueQuantity**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#Quantity">**Quantity**</a>

</span>

<span style="color: navy">**Cholesterol value**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/valueQuantity&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.flag" title="+ | ++ | +++ | - | -- | --- (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**flag**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#code">**code**</a>

</span>

<span style="color: navy">**+ | ++ | +++ | - | -- | ---** </span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/flag&gt;**

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.status" title="The status of the result value">

<b>**status**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#code">**code**</a>

</span>

<span style="color: navy">**Registered|Interim|Final|Amended|Cancelled|Withdrawn**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/status&gt;**</i>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.comments" title="May include statements about significant, unexpected or unreliable. values, or information about the source of the value where this may be relevant to the interpretation of the result. (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**comments**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#string">**string**</a>

</span>

<span style="color: navy">**Comments about result**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/comments&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange" title="Guide for interpretation (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**referenceRange**</b>

</span>

</a>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange.meaning" title="Range is a recommended range">

<b>**meaning**</b>

</a>

<span style="color: brown">

<b>**0..0**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**Range is a recommended range**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/meaning&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange.rangeQuantity" title="&lt;4.5 mmol/L">**rangeQuantity**</a>**&gt;**

**&lt;value&gt;4.5&lt;/value&gt;**

**&lt;status&gt;&amp;lt;&lt;/status&gt;**

**&lt;units&gt;mmol/L&lt;/units&gt;**

**&lt;code&gt;mmol/L&lt;/code&gt;**

**&lt;system&gt;http://unitsofmeasure.org&lt;/system&gt;**

**&lt;rangeQuantity/&gt;**

**&lt;/referenceRange&gt;**

**&lt;/result&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result" title="Group of elements for Triglyceride result (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**result**</b>

</span>

</a>

<span style="color: blue">**&quot;Triglyceride Group&quot;**</span>

<span style="color: Gray"> **--&gt;**</span>

<span style="color: Gray">**&lt;!-- Triglyceride Result --&gt;**</span>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.name" title="Triglyceride (this element must be supported or understood)">

<span style="text-decoration: underline">**name**</span>

</a>**&gt;**

**&lt;coding&gt;**

**&lt;code&gt;35217-9&lt;/code&gt;**

**&lt;system&gt;http://LOINC.org&lt;/system&gt;**

**&lt;display&gt;Triglyceride&lt;/display&gt;**

**&lt;/coding&gt;**

**&lt;name/&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.valueQuantity" title="Triglyceride value. If a result is not available, use the comments field (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**valueQuantity**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#Quantity">**Quantity**</a>

</span>

<span style="color: navy">**Triglyceride value**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/valueQuantity&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.flag" title="+ | ++ | +++ | - | -- | --- (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**flag**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#code">**code**</a>

</span>

<span style="color: navy">**+ | ++ | +++ | - | -- | ---** </span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/flag&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.comments" title="Comments about result (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**comments**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#string">**string**</a>

</span>

<span style="color: navy">**Comments about result**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/comments&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange" title="Guide for interpretation (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**referenceRange**</b>

</span>

</a>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange.meaning" title="Range is a recommended range">

<b>**meaning**</b>

</a>

<span style="color: brown">

<b>**0..0**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**Range is a recommended range**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/meaning&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange.rangeQuantity" title="&lt;2.0 mmol/L">**rangeQuantity**</a>**&gt;**

**&lt;value&gt;2.0&lt;/value&gt;**

**&lt;status&gt;&amp;lt;&lt;/status&gt;**

**&lt;units&gt;mmol/L&lt;/units&gt;**

**&lt;code&gt;mmol/L&lt;/code&gt;**

**&lt;system&gt;http://unitsofmeasure.org&lt;/system&gt;**

**&lt;rangeQuantity/&gt;**

**&lt;/referenceRange&gt;**

**&lt;/result&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result" title="Group of elements for HDL Cholesterol result (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**result**</b>

</span>

</a>

<span style="color: blue">**&quot;HDL Cholesterol Group&quot;**</span>

<span style="color: Gray"> **--&gt;**</span>

<span style="color: Gray">**&lt;!-- HDL Cholesterol Result --&gt;**</span>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.name" title="HDL Cholesterol (this element must be supported or understood)">

<span style="text-decoration: underline">**name**</span>

</a>**&gt;**

**&lt;coding&gt;**

**&lt;code&gt;2085-9&lt;/code&gt;**

**&lt;system&gt;http://LOINC.org&lt;/system&gt;**

**&lt;display&gt;Cholesterol.in HDL&lt;/display&gt;**

**&lt;/coding&gt;**

**&lt;name/&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.valueQuantity" title="HDL Cholesterol value. If a result is not available, use the comments field (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**valueQuantity**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#Quantity">**Quantity**</a>

</span>

<span style="color: navy">**HDL Cholesterol value**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/valueQuantity&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.flag" title="+ | ++ | +++ | - | -- | --- (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**flag**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#code">**code**</a>

</span>

<span style="color: navy">**+ | ++ | +++ | - | -- | ---** </span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/flag&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.comments" title="Comments about result (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**comments**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#string">**string**</a>

</span>

<span style="color: navy">**Comments about result**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/comments&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange" title="Guide for interpretation (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**referenceRange**</b>

</span>

</a>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange.meaning" title="Range is a recommended range">

<b>**meaning**</b>

</a>

<span style="color: brown">

<b>**0..0**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**Range is a recommended range**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/meaning&gt;**

**&lt;**<a href="#DiagnosticReport.resultGroup.result.referenceRange.rangeQuantity" title="">**1.5 mmol/L&quot; class=&quot;dict&quot;&gt;rangeQuantity**</a>**&gt;**

**&lt;value&gt;1.5&lt;/value&gt;**

**&lt;status&gt;&gt;&lt;/status&gt;**

**&lt;units&gt;mmol/L&lt;/units&gt;**

**&lt;code&gt;mmol/L&lt;/code&gt;**

**&lt;system&gt;http://unitsofmeasure.org&lt;/system&gt;**

**&lt;rangeQuantity/&gt;**

**&lt;/referenceRange&gt;**

**&lt;/result&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result" title="LDL Cholesterol result, if reported (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**result**</b>

</span>

</a>

<span style="color: blue">**&quot;LDL Cholesteral Group&quot;**</span>

<span style="color: Gray"> **--&gt;**</span>

<span style="color: Gray">**&lt;!-- LDL Cholesterol result, if reported --&gt;**</span>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.name" title="Group of elements for LDL Cholesterol. LOINC code defines whether LDL is measured or calculated (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**name**</b>

</span>

</a>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**LDL Cholesterol. LOINC code defines measured or calc**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/name&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.valueQuantity" title="LDL Cholesterol value. If a result is not available, use the comments field (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**valueQuantity**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#Quantity">**Quantity**</a>

</span>

<span style="color: navy">**LDL Cholesterol value**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/valueQuantity&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.flag" title="+ | ++ | +++ | - | -- | --- (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**flag**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#code">**code**</a>

</span>

<span style="color: navy">**+ | ++ | +++ | - | -- | ---** </span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/flag&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.comments" title="Comments about result (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**comments**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#string">**string**</a>

</span>

<span style="color: navy">**Comments about result**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/comments&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange" title="Guide for interpretation (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**referenceRange**</b>

</span>

</a>

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange.meaning" title="Range is a recommended range">

<b>**meaning**</b>

</a>

<span style="color: brown">

<b>**0..0**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**Range is a recommended range**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/meaning&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.resultGroup.result.referenceRange.rangeQuantity" title="&lt;3.0 mmol/L">**rangeQuantity**</a>**&gt;**

**&lt;value&gt;3.0&lt;/value&gt;**

**&lt;status&gt;&amp;lt;&lt;/status&gt;**

**&lt;units&gt;mmol/L&lt;/units&gt;**

**&lt;code&gt;mmol/L&lt;/code&gt;**

**&lt;system&gt;http://unitsofmeasure.org&lt;/system&gt;**

**&lt;rangeQuantity/&gt;**

**&lt;/referenceRange&gt;**

**&lt;/result&gt;**

**&lt;/resultGroup&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.conclusion" title="May include diagnosis or suggestions for follow up testing (this element must be supported or understood)">

<span style="text-decoration: underline">

<b>**conclusion**</b>

</span>

</a>

<span style="color: brown">

<b>**0..1**</b>

</span>

<span style="color: darkgreen">

<a href="Narrative.htm#Narrative">**Narrative**</a>

</span>

<span style="color: navy">**Clinical Interpretation of Lipid Panel**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/conclusion&gt;**

**&lt;**<a class="dict" href="#DiagnosticReport.codedDiagnosis" title="Codes for the conclusion">

<b>**codedDiagnosis**</b>

</a>

<span style="color: brown">

<b>**0..0**</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#CodeableConcept">**CodeableConcept**</a>

</span>

<span style="color: navy">**Codes for the conclusion**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/codedDiagnosis&gt;**

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.representation" title="Rich text representation of the entire result as issued by the diagnostic service. Multiple formats are allowed but they must be semantically equivalent.">

<b>**representation**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**0..\***</b>

</span>

<span style="color: darkgreen">

<a href="datatypes.htm#Attachment">**Attachment**</a>

</span>

<span style="color: navy">**Entire Report as issued**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/representation&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.extension" title="See Extensions">

<b>**extension**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<a href="extensibility.htm">

<span style="color: navy">**See Extensions**</span>

</a>

<span style="color: Gray"> **--&gt;**</span>**&lt;/extension&gt;**</i>

<i class="inherited">**&lt;**<a class="dict" href="#DiagnosticReport.text" title="Text summary of report, for human interpretation">

<b>**text**</b>

</a>**&gt;**<span style="color: Gray">**&lt;!--**</span>

<span style="color: brown">

<b>**1..1**</b>

</span>

<span style="color: darkgreen">

<a href="Narrative.htm#Narrative">**Narrative**</a>

</span>

<span style="color: navy">**Text summary of report, for human interpretation**</span>

<span style="color: Gray"> **--&gt;**</span>**&lt;/text&gt;**</i>

**&lt;/DiagnosticReport&gt;**

</pre>

</div>

</text>

<name value="Lipid Profile"/>

<publisher value="Grahame Grieve"/>

<telecom>

<system value="email"/>

<value value="grahame@healthintersections.com.au"/>

</telecom>

<description value="Describes how the lab report is used for a standard Lipid Profile - Cholesterol, Triglyceride and Cholesterol fractions. Uses LOINC codes"/>

<status value="draft"/>

<experimental value="true"/>

<date value="2012-05-12"/>

<structure>

<type value="Resource"/>

<name value="Lipids"/>

<element>

<path value="DiagnosticReport"/>

<name value="Lipids"/>

<definition>

<short value="Lipid Lab Report"/>

<formal value="The findings and interpretation of a general lipid lab profile"/>

<comments value="Not to be used for reporting on non-pathology test results e.g. diagnostic imaging, ECG or respiratory function tests. Not to be used to represent an entire cumulative report. This Pathology test result archetype represents only one of the result sets that is usually viewed as a vertical in a cumulative test report. A cumulative report is a view that is constructed from the results represented by multiple OBSERVATION archetypes. This archetype is suitable for representation of general pathology test results, but not intended to cover full synoptic reports. For these, additional resources are required to represent the data properly"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="Resource"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.id"/>

<definition>

<short value="Master Resource Id, always first in all resources"/>

<formal value="Master Resource Id, always first in all resources"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="id"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.status"/>

<definition>

<short value="registered|interim|final|amended|cancelled|withdrawn"/>

<formal value="The status of the pathology test result as a whole"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="code"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabReportStatus"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.issued"/>

<definition>

<short value="date issued for current status"/>

<formal value="The date and/or time that the result was issued from the source for the recorded Test result status"/>

<comments value="May be different from DiagnosticReport.updated, because that is the status of this record, not the report the record is about"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="instant"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.patient"/>

<definition>

<short value="The patient the report is about"/>

<formal value="The patient about who the report is about"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="Resource(Patient)"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.admission"/>

<definition>

<short value="Admission Context"/>

<formal value="The admission that this diagnostic investigation is associated with"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Resource(Admission)"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.laboratory"/>

<definition>

<short value="Responsible Laboratory"/>

<formal value="The laboratory service that issued the report"/>

<comments value="This is not necessarily the source of the atomic reports - it's the lab that takes responsibility for the clinical report"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="Resource(Organization)"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.reportId"/>

<definition>

<short value="Id for external references to this report"/>

<formal value="The local ID assigned to the report by the order filler, usually by the Laboratory Information System (LIS)."/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Identifier"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.requestDetail"/>

<definition>

<short value="What was requested"/>

<formal value="Details concerning a single pathology test requested."/>

<comments value="Note: Usually there is one test request for each result, however in some circumstances multiple test requests may be represented using a single Pathology test result resource"/>

<min value="0"/>

<max value="\*"/>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.requestDetail.requestOrderId"/>

<definition>

<short value="Id assigned by requester"/>

<formal value="The local ID assigned to the order by the order requester."/>

<comments value="Equivalent to the Placer Order Identifier"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Identifier"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.requestDetail.receiverOrderId"/>

<definition>

<short value="Receiver's Id for the request"/>

<formal value="The local ID assigned to the test order by the order filler, usually by the Laboratory Information System (LIS)."/>

<comments value="Usually equivalent to the DICOM Accession Number and the Filler Order Identifier."/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Identifier"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.requestDetail.requestTest"/>

<definition>

<short value="Test Requested"/>

<formal value="Identification of pathology test requested,"/>

<comments value="Useful where the test requested differs from the test actually performed."/>

<min value="0"/>

<max value="\*"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabRequests"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.requestDetail.requester"/>

<definition>

<short value="Responsible for request"/>

<formal value="Details of the clinician or organization requesting the laboratory test."/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Resource(Practitioner|Organization)"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.requestDetail.clinicalInfo"/>

<definition>

<short value="Clinical information provided"/>

<formal value="Details of the clinical information provided to the laboratory along with the original request"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Resource(Any)"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.reportName"/>

<definition>

<short value="LOINC Code for Lipid Report with LDL"/>

<formal value="LOINC Code for Lipid Report with LDL"/>

<comments value="LOINC code includes &quot;direct&quot; LDL - does this mean LDL derived by measuring VLDL by ultracentrifugation? This panel includes both measured and calculated LDL"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabReportNames"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.service"/>

<definition>

<short value="Biochemistry, Hematology, etc."/>

<formal value="The diagnostic service that performs the examination e.g. biochemistry, hematology."/>

<min value="0"/>

<max value="1"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabServices"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.diagnosticTime"/>

<definition>

<short value="Effective time of diagnostic report"/>

<formal value="The diagnostically relevant time for this report"/>

<comments value="The diagnostically relevant time can be derived from the specimen collection times, but the specimen information is not always available, and the exact relationship is not always automatic"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="dateTime"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.specimen"/>

<definition>

<short value="Specimen (incl. time of collection)"/>

<formal value="Details about the specimen if all individual test results are derived from the same specimen"/>

<comments value="If the specimen is sufficiently specified with a code in the Test result name, then this additional data may be redundant. If there are multiple specimens, these may be represented per 'Result group'"/>

<min value="0"/>

<max value="\*"/>

<type>

<code value="Resource(Specimen)"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup"/>

<definition>

<short value="All the results in one group"/>

<formal value="All the lipid panel results"/>

<comments value="Many (most) lab reports don't really have a meaningful group. In these cases, just create a single group with no specimen or name"/>

<min value="1"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.name"/>

<definition>

<short value="No name needed for the result group"/>

<formal value="No name needed for the result group"/>

<comments value="For example, the antibody code for a group of antibody related tests, or the organism code for a group of isolate/sensitivities. Leave blank if there is no particular meaning associated with the group"/>

<min value="0"/>

<max value="0"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabResultGroupNames"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.specimen"/>

<definition>

<short value="Specimen details"/>

<formal value="Details about the individual specimen to which these Result group test results refer, where testing of multiple specimens is required."/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Resource(Specimen)"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result"/>

<name value="Cholesterol Group"/>

<definition>

<short value="Cholesterol Result"/>

<formal value="Group of elements for Cholesterol result"/>

<min value="1"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.name"/>

<definition>

<short value="Cholesterol"/>

<formal value="Cholesterol"/>

<comments value="results are fundamentally a name - value pair with additional clarifying information"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabResultNames"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.value[x]"/>

<definition>

<short value="Cholesterol value"/>

<formal value="Cholesterol value. If a result is not available, use the comments field"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Quantity"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.flag"/>

<definition>

<short value="+ | ++ | +++ | - | -- | --- "/>

<formal value="+ | ++ | +++ | - | -- | --- "/>

<min value="0"/>

<max value="1"/>

<type>

<code value="code"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabResultFlag"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.status"/>

<definition>

<short value="Registered|Interim|Final|Amended|Cancelled|Withdrawn"/>

<formal value="The status of the result value"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="code"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabReportStatus"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.comments"/>

<definition>

<short value="Comments about result"/>

<formal value="May include statements about significant, unexpected or unreliable. values, or information about the source of the value where this may be relevant to the interpretation of the result."/>

<min value="0"/>

<max value="1"/>

<type>

<code value="string"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange"/>

<definition>

<short value="Guide for interpretation"/>

<formal value="Guide for interpretation"/>

<comments value="Most results only have one reference range. Some non-numerical results don't have a reference range"/>

<min value="1"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange.meaning"/>

<definition>

<short value="Range is a recommended range"/>

<formal value="Range is a recommended range"/>

<comments value="yeah, so I suppose it should be coded, right? But coded how? No publically available terminologies include an appropriate code…"/>

<min value="0"/>

<max value="0"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabReferenceRanges"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange.range[x]"/>

<definition>

<short value="Reference"/>

<formal value="&lt;4.5 mmol/L"/>

<comments value="Per Australian NHF Recommendations"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="Quantity"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result"/>

<name value="Triglyceride Group"/>

<definition>

<short value="Triglyceride Result"/>

<formal value="Group of elements for Triglyceride result"/>

<min value="1"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.name"/>

<definition>

<short value="Triglyceride"/>

<formal value="Triglyceride"/>

<comments value="results are fundamentally a name - value pair with additional clarifying information"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabResultNames"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.value[x]"/>

<definition>

<short value="Triglyceride value"/>

<formal value="Triglyceride value. If a result is not available, use the comments field"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Quantity"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.flag"/>

<definition>

<short value="+ | ++ | +++ | - | -- | --- "/>

<formal value="+ | ++ | +++ | - | -- | --- "/>

<min value="0"/>

<max value="1"/>

<type>

<code value="code"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabResultFlag"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.comments"/>

<definition>

<short value="Comments about result"/>

<formal value="Comments about result"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="string"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange"/>

<definition>

<short value="Guide for interpretation"/>

<formal value="Guide for interpretation"/>

<comments value="Most results only have one reference range. Some non-numerical results don't have a reference range"/>

<min value="1"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange.meaning"/>

<definition>

<short value="Range is a recommended range"/>

<formal value="Range is a recommended range"/>

<comments value="see note above"/>

<min value="0"/>

<max value="0"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabReferenceRanges"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange.range[x]"/>

<definition>

<short value="Reference"/>

<formal value="&lt;2.0 mmol/L"/>

<comments value="Per Australian NHF Recommendations"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="Quantity"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result"/>

<name value="HDL Cholesteral Group"/>

<definition>

<short value="HDL Cholesterol Result"/>

<formal value="Group of elements for HDL Cholesterol result"/>

<min value="1"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.name"/>

<definition>

<short value="HDL Cholesterol"/>

<formal value="HDL Cholesterol"/>

<comments value="results are fundamentally a name - value pair with additional clarifying information"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabResultNames"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.value[x]"/>

<definition>

<short value="HDL Cholesterol value"/>

<formal value="HDL Cholesterol value. If a result is not available, use the comments field"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Quantity"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.flag"/>

<definition>

<short value="+ | ++ | +++ | - | -- | --- "/>

<formal value="+ | ++ | +++ | - | -- | --- "/>

<min value="0"/>

<max value="1"/>

<type>

<code value="code"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabResultFlag"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.comments"/>

<definition>

<short value="Comments about result"/>

<formal value="Comments about result"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="string"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange"/>

<definition>

<short value="Guide for interpretation"/>

<formal value="Guide for interpretation"/>

<comments value="Most results only have one reference range. Some non-numerical results don't have a reference range"/>

<min value="1"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange.meaning"/>

<definition>

<short value="Range is a recommended range"/>

<formal value="Range is a recommended range"/>

<comments value="See note above"/>

<min value="0"/>

<max value="0"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabReferenceRanges"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange.range[x]"/>

<definition>

<short value="Reference"/>

<formal value="&gt;1.5 mmol/L"/>

<comments value="Per Australian NHF Recommendations"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="Quantity"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result"/>

<name value="LDL Cholesteral Group"/>

<definition>

<short value="LDL Cholesterol result, if reported"/>

<formal value="LDL Cholesterol result, if reported"/>

<min value="0"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.name"/>

<definition>

<short value="LDL Cholesterol. LOINC code defines measured or calc"/>

<formal value="Group of elements for LDL Cholesterol. LOINC code defines whether LDL is measured or calculated"/>

<comments value="results are fundamentally a name - value pair with additional clarifying information"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LOINC 35198-1 | LOINC 13457-7"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.value[x]"/>

<definition>

<short value="LDL Cholesterol value"/>

<formal value="LDL Cholesterol value. If a result is not available, use the comments field"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Quantity"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.flag"/>

<definition>

<short value="+ | ++ | +++ | - | -- | --- "/>

<formal value="+ | ++ | +++ | - | -- | --- "/>

<min value="0"/>

<max value="1"/>

<type>

<code value="code"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

<binding value="LabResultFlag"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.comments"/>

<definition>

<short value="Comments about result"/>

<formal value="Comments about result"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="string"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange"/>

<definition>

<short value="Guide for interpretation"/>

<formal value="Guide for interpretation"/>

<comments value="Most results only have one reference range. Some non-numerical results don't have a reference range"/>

<min value="1"/>

<max value="1"/>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange.meaning"/>

<definition>

<short value="Range is a recommended range"/>

<formal value="Range is a recommended range"/>

<comments value="See Note above"/>

<min value="0"/>

<max value="0"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabReferenceRanges"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.resultGroup.result.referenceRange.range[x]"/>

<definition>

<short value="Reference"/>

<formal value="&lt;3.0 mmol/L"/>

<comments value="Per Australian NHF Recommendations"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="Quantity"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.conclusion"/>

<definition>

<short value="Clinical Interpretation of Lipid Panel"/>

<formal value="May include diagnosis or suggestions for follow up testing"/>

<comments value="common reports don't have a conclusion, but some do"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="Narrative"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="true"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.codedDiagnosis"/>

<definition>

<short value="Codes for the conclusion"/>

<formal value="Codes for the conclusion"/>

<min value="0"/>

<max value="0"/>

<type>

<code value="CodeableConcept"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

<binding value="LabDiagnosisCodes"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.representation"/>

<definition>

<short value="Entire Report as issued"/>

<formal value="Rich text representation of the entire result as issued by the diagnostic service. Multiple formats are allowed but they must be semantically equivalent."/>

<comments value="Possible formats: text/html, text/plain, text/rtf, application/msword, application/pdf, application/rtf, application/vnd.oasis.opendocument.text, application/vnd.openxmlformats-officedocument.wordprocessingml.document"/>

<min value="0"/>

<max value="\*"/>

<type>

<code value="Attachment"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.extension"/>

<definition>

<short value="See Extensions"/>

<formal value="See Extensions"/>

<min value="0"/>

<max value="\*"/>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

<element>

<path value="DiagnosticReport.text"/>

<definition>

<short value="Text summary of report, for human interpretation"/>

<formal value="Text summary of report, for human interpretation"/>

<min value="1"/>

<max value="1"/>

<type>

<code value="Narrative"/>

</type>

<mustSupport value="false"/>

<mustUnderstand value="false"/>

</definition>

</element>

</structure>

</Profile>

JSON Equivalent

General Profile Example

{"Profile": {

"structure": [{

"element": [

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Lipid Lab Report"},

"formal": {"value": "The findings and interpretation of a general lipid lab profile"},

"max": {"value": "1"},

"type": [{"code": {"value": "Resource"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Not to be used for reporting on non-pathology test results e.g. diagnostic imaging, ECG or respiratory function tests. Not to be used to represent an entire cumulative report. This Pathology test result archetype represents only one of the result sets that is usually viewed as a vertical in a cumulative test report. A cumulative report is a view that is constructed from the results represented by multiple OBSERVATION archetypes. This archetype is suitable for representation of general pathology test results, but not intended to cover full synoptic reports. For these, additional resources are required to represent the data properly"}

},

"name": {"value": "Lipids"},

"path": {"value": "DiagnosticReport"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Master Resource Id, always first in all resources"},

"formal": {"value": "Master Resource Id, always first in all resources"},

"max": {"value": "1"},

"type": [{"code": {"value": "id"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.id"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "registered|interim|final|amended|cancelled|withdrawn"},

"formal": {"value": "The status of the pathology test result as a whole"},

"max": {"value": "1"},

"binding": {"value": "LabReportStatus"},

"type": [{"code": {"value": "code"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.status"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "date issued for current status"},

"formal": {"value": "The date and/or time that the result was issued from the source for the recorded Test result status"},

"max": {"value": "1"},

"type": [{"code": {"value": "instant"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "May be different from DiagnosticReport.updated, because that is the status of this record, not the report the record is about"}

},

"path": {"value": "DiagnosticReport.issued"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "The patient the report is about"},

"formal": {"value": "The patient about who the report is about"},

"max": {"value": "1"},

"type": [{"code": {"value": "Resource(Patient)"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.patient"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Admission Context"},

"formal": {"value": "The admission that this diagnostic investigation is associated with"},

"max": {"value": "1"},

"type": [{"code": {"value": "Resource(Admission)"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.admission"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Responsible Laboratory"},

"formal": {"value": "The laboratory service that issued the report"},

"max": {"value": "1"},

"type": [{"code": {"value": "Resource(Organization)"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "This is not necessarily the source of the atomic reports - it's the lab that takes responsibility for the clinical report"}

},

"path": {"value": "DiagnosticReport.laboratory"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Id for external references to this report"},

"formal": {"value": "The local ID assigned to the report by the order filler, usually by the Laboratory Information System (LIS)."},

"max": {"value": "1"},

"type": [{"code": {"value": "Identifier"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.reportId"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "What was requested"},

"formal": {"value": "Details concerning a single pathology test requested."},

"max": {"value": "\*"},

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Note: Usually there is one test request for each result, however in some circumstances multiple test requests may be represented using a single Pathology test result resource"}

},

"path": {"value": "DiagnosticReport.requestDetail"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Id assigned by requester"},

"formal": {"value": "The local ID assigned to the order by the order requester."},

"max": {"value": "1"},

"type": [{"code": {"value": "Identifier"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Equivalent to the Placer Order Identifier"}

},

"path": {"value": "DiagnosticReport.requestDetail.requestOrderId"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Receiver's Id for the request"},

"formal": {"value": "The local ID assigned to the test order by the order filler, usually by the Laboratory Information System (LIS)."},

"max": {"value": "1"},

"type": [{"code": {"value": "Identifier"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Usually equivalent to the DICOM Accession Number and the Filler Order Identifier."}

},

"path": {"value": "DiagnosticReport.requestDetail.receiverOrderId"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Test Requested"},

"formal": {"value": "Identification of pathology test requested,"},

"max": {"value": "\*"},

"binding": {"value": "LabRequests"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Useful where the test requested differs from the test actually performed."}

},

"path": {"value": "DiagnosticReport.requestDetail.requestTest"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Responsible for request"},

"formal": {"value": "Details of the clinician or organization requesting the laboratory test."},

"max": {"value": "1"},

"type": [{"code": {"value": "Resource(Practitioner|Organization)"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.requestDetail.requester"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Clinical information provided"},

"formal": {"value": "Details of the clinical information provided to the laboratory along with the original request"},

"max": {"value": "1"},

"type": [{"code": {"value": "Resource(Any)"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.requestDetail.clinicalInfo"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "LOINC Code for Lipid Report with LDL"},

"formal": {"value": "LOINC Code for Lipid Report with LDL"},

"max": {"value": "1"},

"binding": {"value": "LabReportNames"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "LOINC code includes \"direct\" LDL - does this mean LDL derived by measuring VLDL by ultracentrifugation? This panel includes both measured and calculated LDL"}

},

"path": {"value": "DiagnosticReport.reportName"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Biochemistry, Hematology, etc."},

"formal": {"value": "The diagnostic service that performs the examination e.g. biochemistry, hematology."},

"max": {"value": "1"},

"binding": {"value": "LabServices"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.service"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Effective time of diagnostic report"},

"formal": {"value": "The diagnostically relevant time for this report"},

"max": {"value": "1"},

"type": [{"code": {"value": "dateTime"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "The diagnostically relevant time can be derived from the specimen collection times, but the specimen information is not always available, and the exact relationship is not always automatic"}

},

"path": {"value": "DiagnosticReport.diagnosticTime"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Specimen (incl. time of collection)"},

"formal": {"value": "Details about the specimen if all individual test results are derived from the same specimen"},

"max": {"value": "\*"},

"type": [{"code": {"value": "Resource(Specimen)"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "If the specimen is sufficiently specified with a code in the Test result name, then this additional data may be redundant. If there are multiple specimens, these may be represented per 'Result group'"}

},

"path": {"value": "DiagnosticReport.specimen"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "All the results in one group"},

"formal": {"value": "All the lipid panel results"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "Many (most) lab reports don't really have a meaningful group. In these cases, just create a single group with no specimen or name"}

},

"path": {"value": "DiagnosticReport.resultGroup"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "No name needed for the result group"},

"formal": {"value": "No name needed for the result group"},

"max": {"value": "0"},

"binding": {"value": "LabResultGroupNames"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "For example, the antibody code for a group of antibody related tests, or the organism code for a group of isolate/sensitivities. Leave blank if there is no particular meaning associated with the group"}

},

"path": {"value": "DiagnosticReport.resultGroup.name"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Specimen details"},

"formal": {"value": "Details about the individual specimen to which these Result group test results refer, where testing of multiple specimens is required."},

"max": {"value": "1"},

"type": [{"code": {"value": "Resource(Specimen)"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.specimen"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Cholesterol Result"},

"formal": {"value": "Group of elements for Cholesterol result"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"name": {"value": "Cholesterol Group"},

"path": {"value": "DiagnosticReport.resultGroup.result"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Cholesterol"},

"formal": {"value": "Cholesterol"},

"max": {"value": "1"},

"binding": {"value": "LabResultNames"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "results are fundamentally a name - value pair with additional clarifying information"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.name"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Cholesterol value"},

"formal": {"value": "Cholesterol value. If a result is not available, use the comments field"},

"max": {"value": "1"},

"type": [{"code": {"value": "Quantity"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.value[x]"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "+ | ++ | +++ | - | -- | --- "},

"formal": {"value": "+ | ++ | +++ | - | -- | --- "},

"max": {"value": "1"},

"binding": {"value": "LabResultFlag"},

"type": [{"code": {"value": "code"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.flag"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Registered|Interim|Final|Amended|Cancelled|Withdrawn"},

"formal": {"value": "The status of the result value"},

"max": {"value": "1"},

"binding": {"value": "LabReportStatus"},

"type": [{"code": {"value": "code"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.status"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Comments about result"},

"formal": {"value": "May include statements about significant, unexpected or unreliable. values, or information about the source of the value where this may be relevant to the interpretation of the result."},

"max": {"value": "1"},

"type": [{"code": {"value": "string"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.comments"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Guide for interpretation"},

"formal": {"value": "Guide for interpretation"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "Most results only have one reference range. Some non-numerical results don't have a reference range"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Range is a recommended range"},

"formal": {"value": "Range is a recommended range"},

"max": {"value": "0"},

"binding": {"value": "LabReferenceRanges"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "yeah, so I suppose it should be coded, right? But coded how? No publically available terminologies include an appropriate code\u2026"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange.meaning"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Reference"},

"formal": {"value": "<4.5 mmol/L"},

"max": {"value": "1"},

"type": [{"code": {"value": "Quantity"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Per Australian NHF Recommendations"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange.range[x]"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Triglyceride Result"},

"formal": {"value": "Group of elements for Triglyceride result"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"name": {"value": "Triglyceride Group"},

"path": {"value": "DiagnosticReport.resultGroup.result"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Triglyceride"},

"formal": {"value": "Triglyceride"},

"max": {"value": "1"},

"binding": {"value": "LabResultNames"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "results are fundamentally a name - value pair with additional clarifying information"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.name"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Triglyceride value"},

"formal": {"value": "Triglyceride value. If a result is not available, use the comments field"},

"max": {"value": "1"},

"type": [{"code": {"value": "Quantity"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.value[x]"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "+ | ++ | +++ | - | -- | --- "},

"formal": {"value": "+ | ++ | +++ | - | -- | --- "},

"max": {"value": "1"},

"binding": {"value": "LabResultFlag"},

"type": [{"code": {"value": "code"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.flag"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Comments about result"},

"formal": {"value": "Comments about result"},

"max": {"value": "1"},

"type": [{"code": {"value": "string"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.comments"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Guide for interpretation"},

"formal": {"value": "Guide for interpretation"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "Most results only have one reference range. Some non-numerical results don't have a reference range"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Range is a recommended range"},

"formal": {"value": "Range is a recommended range"},

"max": {"value": "0"},

"binding": {"value": "LabReferenceRanges"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "see note above"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange.meaning"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Reference"},

"formal": {"value": "<2.0 mmol/L"},

"max": {"value": "1"},

"type": [{"code": {"value": "Quantity"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Per Australian NHF Recommendations"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange.range[x]"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "HDL Cholesterol Result"},

"formal": {"value": "Group of elements for HDL Cholesterol result"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"name": {"value": "HDL Cholesteral Group"},

"path": {"value": "DiagnosticReport.resultGroup.result"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "HDL Cholesterol"},

"formal": {"value": "HDL Cholesterol"},

"max": {"value": "1"},

"binding": {"value": "LabResultNames"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "results are fundamentally a name - value pair with additional clarifying information"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.name"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "HDL Cholesterol value"},

"formal": {"value": "HDL Cholesterol value. If a result is not available, use the comments field"},

"max": {"value": "1"},

"type": [{"code": {"value": "Quantity"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.value[x]"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "+ | ++ | +++ | - | -- | --- "},

"formal": {"value": "+ | ++ | +++ | - | -- | --- "},

"max": {"value": "1"},

"binding": {"value": "LabResultFlag"},

"type": [{"code": {"value": "code"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.flag"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Comments about result"},

"formal": {"value": "Comments about result"},

"max": {"value": "1"},

"type": [{"code": {"value": "string"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.comments"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Guide for interpretation"},

"formal": {"value": "Guide for interpretation"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "Most results only have one reference range. Some non-numerical results don't have a reference range"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Range is a recommended range"},

"formal": {"value": "Range is a recommended range"},

"max": {"value": "0"},

"binding": {"value": "LabReferenceRanges"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "See note above"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange.meaning"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Reference"},

"formal": {"value": ">1.5 mmol/L"},

"max": {"value": "1"},

"type": [{"code": {"value": "Quantity"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Per Australian NHF Recommendations"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange.range[x]"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "LDL Cholesterol result, if reported"},

"formal": {"value": "LDL Cholesterol result, if reported"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"name": {"value": "LDL Cholesteral Group"},

"path": {"value": "DiagnosticReport.resultGroup.result"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "LDL Cholesterol. LOINC code defines measured or calc"},

"formal": {"value": "Group of elements for LDL Cholesterol. LOINC code defines whether LDL is measured or calculated"},

"max": {"value": "1"},

"binding": {"value": "LOINC 35198-1 | LOINC 13457-7"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "results are fundamentally a name - value pair with additional clarifying information"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.name"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "LDL Cholesterol value"},

"formal": {"value": "LDL Cholesterol value. If a result is not available, use the comments field"},

"max": {"value": "1"},

"type": [{"code": {"value": "Quantity"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.value[x]"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "+ | ++ | +++ | - | -- | --- "},

"formal": {"value": "+ | ++ | +++ | - | -- | --- "},

"max": {"value": "1"},

"binding": {"value": "LabResultFlag"},

"type": [{"code": {"value": "code"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.flag"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Comments about result"},

"formal": {"value": "Comments about result"},

"max": {"value": "1"},

"type": [{"code": {"value": "string"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.comments"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Guide for interpretation"},

"formal": {"value": "Guide for interpretation"},

"max": {"value": "1"},

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "Most results only have one reference range. Some non-numerical results don't have a reference range"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Range is a recommended range"},

"formal": {"value": "Range is a recommended range"},

"max": {"value": "0"},

"binding": {"value": "LabReferenceRanges"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "See Note above"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange.meaning"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Reference"},

"formal": {"value": "<3.0 mmol/L"},

"max": {"value": "1"},

"type": [{"code": {"value": "Quantity"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Per Australian NHF Recommendations"}

},

"path": {"value": "DiagnosticReport.resultGroup.result.referenceRange.range[x]"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Clinical Interpretation of Lipid Panel"},

"formal": {"value": "May include diagnosis or suggestions for follow up testing"},

"max": {"value": "1"},

"type": [{"code": {"value": "Narrative"}}],

"mustUnderstand": {"value": "true"},

"mustSupport": {"value": "false"},

"comments": {"value": "common reports don't have a conclusion, but some do"}

},

"path": {"value": "DiagnosticReport.conclusion"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Codes for the conclusion"},

"formal": {"value": "Codes for the conclusion"},

"max": {"value": "0"},

"binding": {"value": "LabDiagnosisCodes"},

"type": [{"code": {"value": "CodeableConcept"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.codedDiagnosis"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "Entire Report as issued"},

"formal": {"value": "Rich text representation of the entire result as issued by the diagnostic service. Multiple formats are allowed but they must be semantically equivalent."},

"max": {"value": "\*"},

"type": [{"code": {"value": "Attachment"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"},

"comments": {"value": "Possible formats: text/html, text/plain, text/rtf, application/msword, application/pdf, application/rtf, application/vnd.oasis.opendocument.text, application/vnd.openxmlformats-officedocument.wordprocessingml.document"}

},

"path": {"value": "DiagnosticReport.representation"}

},

{

"definition": {

"min": {"value": "0"},

"short": {"value": "See Extensions"},

"formal": {"value": "See Extensions"},

"max": {"value": "\*"},

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.extension"}

},

{

"definition": {

"min": {"value": "1"},

"short": {"value": "Text summary of report, for human interpretation"},

"formal": {"value": "Text summary of report, for human interpretation"},

"max": {"value": "1"},

"type": [{"code": {"value": "Narrative"}}],

"mustUnderstand": {"value": "false"},

"mustSupport": {"value": "false"}

},

"path": {"value": "DiagnosticReport.text"}

}

],

"name": {"value": "Lipids"},

"type": {"value": "Resource"}

}],

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(this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.comments\">\n <span style=\"text-decoration: underline\">\n <b>comments<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#string\">string<\/a>\n <\/span>\n <span style=\"color: navy\">Comments about result<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/comments&gt;\n &lt;<a title=\"Guide for interpretation (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange\">\n <span style=\"text-decoration: underline\">\n <b>referenceRange<\/b>\n <\/span>\n <\/a>\n &lt;<a title=\"Range is a recommended range\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange.meaning\">\n <b>meaning<\/b>\n <\/a>\n <span style=\"color: brown\">\n <b>0..0<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#CodeableConcept\">CodeableConcept<\/a>\n <\/span>\n <span style=\"color: navy\">Range is a recommended range<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/meaning&gt;\n &lt;<a title=\"&lt;4.5 mmol/L\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange.rangeQuantity\">rangeQuantity<\/a>&gt;\n &lt;value&gt;4.5&lt;/value&gt;\n &lt;status&gt;&amp;lt;&lt;/status&gt;\n &lt;units&gt;mmol/L&lt;/units&gt;\n &lt;code&gt;mmol/L&lt;/code&gt;\n &lt;system&gt;http://unitsofmeasure.org&lt;/system&gt;\n &lt;rangeQuantity/&gt;\n &lt;/referenceRange&gt;\n &lt;/result&gt;\n &lt;<a title=\"Group of elements for Triglyceride result (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result\">\n <span style=\"text-decoration: underline\">\n <b>result<\/b>\n <\/span>\n <\/a>\n <span style=\"color: blue\">&quot;Triglyceride Group&quot;<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>\n <span style=\"color: Gray\">&lt;!-- Triglyceride Result --&gt;<\/span>\n &lt;<a title=\"Triglyceride (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.name\">\n <span style=\"text-decoration: underline\">name<\/span>\n <\/a>&gt;\n &lt;coding&gt;\n &lt;code&gt;35217-9&lt;/code&gt;\n &lt;system&gt;http://LOINC.org&lt;/system&gt;\n &lt;display&gt;Triglyceride&lt;/display&gt;\n &lt;/coding&gt;\n &lt;name/&gt;\n &lt;<a title=\"Triglyceride value. If a result is not available, use the comments field (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.valueQuantity\">\n <span style=\"text-decoration: underline\">\n <b>valueQuantity<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#Quantity\">Quantity<\/a>\n <\/span>\n <span style=\"color: navy\">Triglyceride value<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/valueQuantity&gt;\n &lt;<a title=\"+ | ++ | +++ | - | -- | --- (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.flag\">\n <span style=\"text-decoration: underline\">\n <b>flag<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#code\">code<\/a>\n <\/span>\n <span style=\"color: navy\">+ | ++ | +++ | - | -- | --- <\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/flag&gt;\n &lt;<a title=\"Comments about result (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.comments\">\n <span style=\"text-decoration: underline\">\n <b>comments<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#string\">string<\/a>\n <\/span>\n <span style=\"color: navy\">Comments about result<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/comments&gt;\n &lt;<a title=\"Guide for interpretation (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange\">\n <span style=\"text-decoration: underline\">\n <b>referenceRange<\/b>\n <\/span>\n <\/a>\n &lt;<a title=\"Range is a recommended range\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange.meaning\">\n <b>meaning<\/b>\n <\/a>\n <span style=\"color: brown\">\n <b>0..0<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#CodeableConcept\">CodeableConcept<\/a>\n <\/span>\n <span style=\"color: navy\">Range is a recommended range<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/meaning&gt;\n &lt;<a title=\"&lt;2.0 mmol/L\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange.rangeQuantity\">rangeQuantity<\/a>&gt;\n &lt;value&gt;2.0&lt;/value&gt;\n &lt;status&gt;&amp;lt;&lt;/status&gt;\n &lt;units&gt;mmol/L&lt;/units&gt;\n &lt;code&gt;mmol/L&lt;/code&gt;\n &lt;system&gt;http://unitsofmeasure.org&lt;/system&gt;\n &lt;rangeQuantity/&gt;\n &lt;/referenceRange&gt;\n &lt;/result&gt;\n &lt;<a title=\"Group of elements for HDL Cholesterol result (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result\">\n <span style=\"text-decoration: underline\">\n <b>result<\/b>\n <\/span>\n <\/a>\n <span style=\"color: blue\">&quot;HDL Cholesteral Group&quot;<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>\n <span style=\"color: Gray\">&lt;!-- HDL Cholesterol Result --&gt;<\/span>\n &lt;<a title=\"HDL Cholesterol (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.name\">\n <span style=\"text-decoration: underline\">name<\/span>\n <\/a>&gt;\n &lt;coding&gt;\n &lt;code&gt;2085-9&lt;/code&gt;\n &lt;system&gt;http://LOINC.org&lt;/system&gt;\n &lt;display&gt;Cholesterol.in HDL&lt;/display&gt;\n &lt;/coding&gt;\n &lt;name/&gt;\n &lt;<a title=\"HDL Cholesterol value. If a result is not available, use the comments field (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.valueQuantity\">\n <span style=\"text-decoration: underline\">\n <b>valueQuantity<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#Quantity\">Quantity<\/a>\n <\/span>\n <span style=\"color: navy\">HDL Cholesterol value<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/valueQuantity&gt;\n &lt;<a title=\"+ | ++ | +++ | - | -- | --- (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.flag\">\n <span style=\"text-decoration: underline\">\n <b>flag<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#code\">code<\/a>\n <\/span>\n <span style=\"color: navy\">+ | ++ | +++ | - | -- | --- <\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/flag&gt;\n &lt;<a title=\"Comments about result (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.comments\">\n <span style=\"text-decoration: underline\">\n <b>comments<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#string\">string<\/a>\n <\/span>\n <span style=\"color: navy\">Comments about result<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/comments&gt;\n &lt;<a title=\"Guide for interpretation (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange\">\n <span style=\"text-decoration: underline\">\n <b>referenceRange<\/b>\n <\/span>\n <\/a>\n &lt;<a title=\"Range is a recommended range\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange.meaning\">\n <b>meaning<\/b>\n <\/a>\n <span style=\"color: brown\">\n <b>0..0<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#CodeableConcept\">CodeableConcept<\/a>\n <\/span>\n <span style=\"color: navy\">Range is a recommended range<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/meaning&gt;\n &lt;<a title=\"null\" href=\"#DiagnosticReport.resultGroup.result.referenceRange.rangeQuantity\">1.5 mmol/L&quot; class=&quot;dict&quot;&gt;rangeQuantity<\/a>&gt;\n &lt;value&gt;1.5&lt;/value&gt;\n &lt;status&gt;&gt;&lt;/status&gt;\n &lt;units&gt;mmol/L&lt;/units&gt;\n &lt;code&gt;mmol/L&lt;/code&gt;\n &lt;system&gt;http://unitsofmeasure.org&lt;/system&gt;\n &lt;rangeQuantity/&gt;\n &lt;/referenceRange&gt;\n &lt;/result&gt;\n &lt;<a title=\"LDL Cholesterol result, if reported (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result\">\n <span style=\"text-decoration: underline\">\n <b>result<\/b>\n <\/span>\n <\/a>\n <span style=\"color: blue\">&quot;LDL Cholesteral Group&quot;<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>\n <span style=\"color: Gray\">&lt;!-- LDL Cholesterol result, if reported --&gt;<\/span>\n &lt;<a title=\"Group of elements for LDL Cholesterol. LOINC code defines whether LDL is measured or calculated (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.name\">\n <span style=\"text-decoration: underline\">\n <b>name<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>1..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#CodeableConcept\">CodeableConcept<\/a>\n <\/span>\n <span style=\"color: navy\">LDL Cholesterol. LOINC code defines measured or calc<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/name&gt;\n &lt;<a title=\"LDL Cholesterol value. If a result is not available, use the comments field (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.valueQuantity\">\n <span style=\"text-decoration: underline\">\n <b>valueQuantity<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#Quantity\">Quantity<\/a>\n <\/span>\n <span style=\"color: navy\">LDL Cholesterol value<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/valueQuantity&gt;\n &lt;<a title=\"+ | ++ | +++ | - | -- | --- (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.flag\">\n <span style=\"text-decoration: underline\">\n <b>flag<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#code\">code<\/a>\n <\/span>\n <span style=\"color: navy\">+ | ++ | +++ | - | -- | --- <\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/flag&gt;\n &lt;<a title=\"Comments about result (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.comments\">\n <span style=\"text-decoration: underline\">\n <b>comments<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#string\">string<\/a>\n <\/span>\n <span style=\"color: navy\">Comments about result<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/comments&gt;\n &lt;<a title=\"Guide for interpretation (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange\">\n <span style=\"text-decoration: underline\">\n <b>referenceRange<\/b>\n <\/span>\n <\/a>\n &lt;<a title=\"Range is a recommended range\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange.meaning\">\n <b>meaning<\/b>\n <\/a>\n <span style=\"color: brown\">\n <b>0..0<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#CodeableConcept\">CodeableConcept<\/a>\n <\/span>\n <span style=\"color: navy\">Range is a recommended range<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/meaning&gt;\n &lt;<a title=\"&lt;3.0 mmol/L\" class=\"dict\" href=\"#DiagnosticReport.resultGroup.result.referenceRange.rangeQuantity\">rangeQuantity<\/a>&gt;\n &lt;value&gt;3.0&lt;/value&gt;\n &lt;status&gt;&amp;lt;&lt;/status&gt;\n &lt;units&gt;mmol/L&lt;/units&gt;\n &lt;code&gt;mmol/L&lt;/code&gt;\n &lt;system&gt;http://unitsofmeasure.org&lt;/system&gt;\n &lt;rangeQuantity/&gt;\n &lt;/referenceRange&gt;\n &lt;/result&gt;\n &lt;/resultGroup&gt;\n &lt;<a title=\"May include diagnosis or suggestions for follow up testing (this element must be supported or understood)\" class=\"dict\" href=\"#DiagnosticReport.conclusion\">\n <span style=\"text-decoration: underline\">\n <b>conclusion<\/b>\n <\/span>\n <\/a>\n <span style=\"color: brown\">\n <b>0..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"Narrative.htm#Narrative\">Narrative<\/a>\n <\/span>\n <span style=\"color: navy\">Clinical Interpretation of Lipid Panel<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/conclusion&gt;\n &lt;<a title=\"Codes for the conclusion\" class=\"dict\" href=\"#DiagnosticReport.codedDiagnosis\">\n <b>codedDiagnosis<\/b>\n <\/a>\n <span style=\"color: brown\">\n <b>0..0<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#CodeableConcept\">CodeableConcept<\/a>\n <\/span>\n <span style=\"color: navy\">Codes for the conclusion<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/codedDiagnosis&gt;\n <i class=\"inherited\">&lt;<a title=\"Rich text representation of the entire result as issued by the diagnostic service. Multiple formats are allowed but they must be semantically equivalent.\" class=\"dict\" href=\"#DiagnosticReport.representation\">\n <b>representation<\/b>\n <\/a>&gt;<span style=\"color: Gray\">&lt;!--<\/span>\n <span style=\"color: brown\">\n <b>0..\*<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"datatypes.htm#Attachment\">Attachment<\/a>\n <\/span>\n <span style=\"color: navy\">Entire Report as issued<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/representation&gt;<\/i>\n <i class=\"inherited\">&lt;<a title=\"See Extensions\" class=\"dict\" href=\"#DiagnosticReport.extension\">\n <b>extension<\/b>\n <\/a>&gt;<span style=\"color: Gray\">&lt;!--<\/span>\n <a href=\"extensibility.htm\">\n <span style=\"color: navy\">See Extensions<\/span>\n <\/a>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/extension&gt;<\/i>\n <i class=\"inherited\">&lt;<a title=\"Text summary of report, for human interpretation\" class=\"dict\" href=\"#DiagnosticReport.text\">\n <b>text<\/b>\n <\/a>&gt;<span style=\"color: Gray\">&lt;!--<\/span>\n <span style=\"color: brown\">\n <b>1..1<\/b>\n <\/span>\n <span style=\"color: darkgreen\">\n <a href=\"Narrative.htm#Narrative\">Narrative<\/a>\n <\/span>\n <span style=\"color: navy\">Text summary of report, for human interpretation<\/span>\n <span style=\"color: Gray\"> --&gt;<\/span>&lt;/text&gt;<\/i>\n&lt;/DiagnosticReport&gt;\n<\/pre>\n <\/div>"

},

"status": {"value": "draft"},

"description": {"value": "Describes how the lab report is used for a standard Lipid Profile - Cholesterol, Triglyceride and Cholesterol fractions. Uses LOINC codes"},

"name": {"value": "Lipid Profile"},

"telecom": [{

"system": {"value": "email"},

"value": {"value": "grahame@healthintersections.com.au"}

}],

"experimental": {"value": "true"},

"date": {"value": "2012-05-12"},

"publisher": {"value": "Grahame Grieve"}

}}

#### 4.43.0.54: Tools Extensions

Extensions defined by the build tools. These extensions are candidates for being elevated into the core

Extensions defined by the build tools. These extensions are candidates for being elevated into the core (id = "tools-extensions")

<Profile xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p><b>**http://hl7.org/fhir/tools/extensions**</b></p>

<p>**Extensions defined by the build tools. These extensions are candidates for being elevated into the core.**</p>

<table>

<tr>

<td><b>**Code**</b></td>

<td><b>**Context**</b></td>

<td><b>**Type**</b></td>

<td><b>**Cardinality**</b></td>

<td><b>**Notes**</b></td>

</tr>

<tr>

<td>**comment**</td>

<td>**ValueSet.compose.include.code**</td>

<td>**string**</td>

<td>**0..1**</td>

<td>**This is used in various FHIR value sets to make comments on how particular codes are used when the formal definition is a little abstract or vague, but it's not clear whether it belongs in the actual value set resource**</td>

</tr>

<tr>

<td>**display**</td>

<td>**ValueSet.compose.include.code**</td>

<td>**string**</td>

<td>**0..1**</td>

<td>**An alternative display is used to tailor a code's description to a particular use case. Doing this is dangerous, because it's easy to introduce a different meaning for the code in this context, but it's also useful to make the display suitable for a particular kind of user in a particular kind of context**</td>

</tr>

<tr>

<td>**definition**</td>

<td>**ValueSet.compose.include.code**</td>

<td>**string**</td>

<td>**0..1**</td>

<td>**This is provided for when the source code system doesn't actually provide a definition (there are many such). Providing an definition for a code should not be done where the underlying code system provides a definition**</td>

</tr>

<tr>

<td>**issue-source**</td>

<td>**OperationOutcome**</td>

<td>**string**</td>

<td>**0..1**</td>

<td>**Helps a user track down the source of the problem**</td>

</tr>

</table>

</div>

</text>

<contained>

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<name value="OperationOutcomeSource"/>

<description value="Where in the code - schema, schematron, or validator - an error message comes from"/>

<status value="draft"/>

<define>

<system value="http://hl7.org/fhir/operation-outcome-source"/>

<caseSensitive value="true"/>

<concept>

<code value="ExampleValidator"/>

<display value="ExampleValidator"/>

<definition value="The error comes from the publication example validator (only in the build process)"/>

</concept>

<concept>

<code value="ProfileValidator"/>

<display value="ProfileValidator"/>

<definition value="The error comes from the code that checks that profiles are valid"/>

</concept>

<concept>

<code value="ResourceValidator"/>

<display value="ResourceValidator"/>

<definition value="The error comes from the code the validates the basic resource definitions"/>

</concept>

<concept>

<code value="InstanceValidator"/>

<display value="InstanceValidator"/>

<definition value="The error comes from code that checks instances against the base profiles and any additional identified profiles"/>

</concept>

<concept>

<code value="Schema"/>

<display value="Schema"/>

<definition value="The error comes from checking the instance against the schemas"/>

</concept>

<concept>

<code value="Schematron"/>

<display value="Schematron"/>

<definition value="The error comes from checking the instance against the invariants defined in the specification"/>

</concept>

</define>

</ValueSet>

</contained>

<identifier value="http://hl7.org/fhir/tools/extensions"/>

<name value="Extensions defined by the FHIR build tools"/>

<publisher value="FHIR Project Team"/>

<telecom>

<system value="url"/>

<value value="http://hl7.org/fhir"/>

</telecom>

<description value="Extensions defined by the build tools. These extensions are candidates for being elevated into the core"/>

<status value="draft"/>

<date value="2013-07-07"/>

<extensionDefn>

<code value="comment"/>

<contextType value="resource"/>

<context value="ValueSet.compose.include.code"/>

<definition>

<short value="Comment about the use of this code in this context"/>

<formal value="A comment that explains how this code is used in this context (where the value set is expected to be used)"/>

<comments value="This is used in various FHIR value sets to make comments on how particular codes are used when the formal definition is a little abstract or vague, but it's not clear whether it belongs in the actual value set resource"/>

<requirements value="Too many codes have very abstract definitions, and the correct use or purpose of the code isn't sufficiently clear from the definition"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="string"/>

</type>

</definition>

</extensionDefn>

<extensionDefn>

<code value="display"/>

<contextType value="resource"/>

<context value="ValueSet.compose.include.code"/>

<definition>

<short value="A different display for this code"/>

<formal value="A different display to use when this code is used as part of this value set"/>

<comments value="An alternative display is used to tailor a code's description to a particular use case. Doing this is dangerous, because it's easy to introduce a different meaning for the code in this context, but it's also useful to make the display suitable for a particular kind of user in a particular kind of context"/>

<requirements value="Many codes have displays that are inappropriate in a particular context of use"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="string"/>

</type>

</definition>

</extensionDefn>

<extensionDefn>

<code value="definition"/>

<contextType value="resource"/>

<context value="ValueSet.compose.include.code"/>

<definition>

<short value="A definition for this code"/>

<formal value="A display name that describes the meaning of this code when used as part of this value set"/>

<comments value="This is provided for when the source code system doesn't actually provide a definition (there are many such). Providing an definition for a code should not be done where the underlying code system provides a definition"/>

<requirements value="Some code systems don't provide definitions (most enumeration types)"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="string"/>

</type>

</definition>

</extensionDefn>

<extensionDefn>

<code value="issue-source"/>

<contextType value="resource"/>

<context value="OperationOutcome"/>

<definition>

<short value="Source of a validation message"/>

<formal value="Where in the code - schema, schematron, or validator - an error message comes from"/>

<comments value="Helps a user track down the source of the problem"/>

<min value="0"/>

<max value="1"/>

<type>

<code value="code"/>

</type>

<binding value="OperationOutcomeSource"/>

</definition>

</extensionDefn>

<binding>

<name value="OperationOutcomeSource"/>

<isExtensible value="true"/>

<conformance value="preferred"/>

<referenceResource>

<type value="ValueSet"/>

<reference value="#v1"/>

</referenceResource>

</binding>

</Profile>

JSON Equivalent

Extensions defined by the build tools. These extensions are candidates for being elevated into the core

{"Profile": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p><b>http://hl7.org/fhir/tools/extensions<\/b><\/p>\n <p>Extensions defined by the build tools. These extensions are candidates for being elevated into the core.<\/p>\n <table>\n <tr>\n <td><b>Code<\/b><\/td>\n <td><b>Context<\/b><\/td>\n <td><b>Type<\/b><\/td>\n <td><b>Cardinality<\/b><\/td>\n <td><b>Notes<\/b><\/td>\n <\/tr>\n <tr>\n <td>comment<\/td>\n <td>ValueSet.compose.include.code<\/td>\n <td>string<\/td>\n <td>0..1<\/td>\n <td>This is used in various FHIR value sets to make comments on how particular codes are used when the formal definition is a little abstract or vague, but it's not clear whether it belongs in the actual value set resource<\/td>\n <\/tr>\n <tr>\n <td>display<\/td>\n <td>ValueSet.compose.include.code<\/td>\n <td>string<\/td>\n <td>0..1<\/td>\n <td>An alternative display is used to tailor a code's description to a particular use case. Doing this is dangerous, because it's easy to introduce a different meaning for the code in this context, but it's also useful to make the display suitable for a particular kind of user in a particular kind of context<\/td>\n <\/tr>\n <tr>\n <td>definition<\/td>\n <td>ValueSet.compose.include.code<\/td>\n <td>string<\/td>\n <td>0..1<\/td>\n <td>This is provided for when the source code system doesn't actually provide a definition (there are many such). Providing an definition for a code should not be done where the underlying code system provides a definition<\/td>\n <\/tr>\n <tr>\n <td>issue-source<\/td>\n <td>OperationOutcome<\/td>\n <td>string<\/td>\n <td>0..1<\/td>\n <td>Helps a user track down the source of the problem<\/td>\n <\/tr>\n <\/table>\n <\/div>"

},

"status": {"value": "draft"},

"extensionDefn": [

{

"contextType": {"value": "resource"},

"definition": {

"min": {"value": "0"},

"short": {"value": "Comment about the use of this code in this context"},

"formal": {"value": "A comment that explains how this code is used in this context (where the value set is expected to be used)"},

"max": {"value": "1"},

"type": [{"code": {"value": "string"}}],

"requirements": {"value": "Too many codes have very abstract definitions, and the correct use or purpose of the code isn't sufficiently clear from the definition"},

"comments": {"value": "This is used in various FHIR value sets to make comments on how particular codes are used when the formal definition is a little abstract or vague, but it's not clear whether it belongs in the actual value set resource"}

},

"context": [{"value": "ValueSet.compose.include.code"}],

"code": {"value": "comment"}

},

{

"contextType": {"value": "resource"},

"definition": {

"min": {"value": "0"},

"short": {"value": "A different display for this code"},

"formal": {"value": "A different display to use when this code is used as part of this value set"},

"max": {"value": "1"},

"type": [{"code": {"value": "string"}}],

"requirements": {"value": "Many codes have displays that are inappropriate in a particular context of use"},

"comments": {"value": "An alternative display is used to tailor a code's description to a particular use case. Doing this is dangerous, because it's easy to introduce a different meaning for the code in this context, but it's also useful to make the display suitable for a particular kind of user in a particular kind of context"}

},

"context": [{"value": "ValueSet.compose.include.code"}],

"code": {"value": "display"}

},

{

"contextType": {"value": "resource"},

"definition": {

"min": {"value": "0"},

"short": {"value": "A definition for this code"},

"formal": {"value": "A display name that describes the meaning of this code when used as part of this value set"},

"max": {"value": "1"},

"type": [{"code": {"value": "string"}}],

"requirements": {"value": "Some code systems don't provide definitions (most enumeration types)"},

"comments": {"value": "This is provided for when the source code system doesn't actually provide a definition (there are many such). Providing an definition for a code should not be done where the underlying code system provides a definition"}

},

"context": [{"value": "ValueSet.compose.include.code"}],

"code": {"value": "definition"}

},

{

"contextType": {"value": "resource"},

"definition": {

"min": {"value": "0"},

"short": {"value": "Source of a validation message"},

"formal": {"value": "Where in the code - schema, schematron, or validator - an error message comes from"},

"max": {"value": "1"},

"binding": {"value": "OperationOutcomeSource"},

"type": [{"code": {"value": "code"}}],

"comments": {"value": "Helps a user track down the source of the problem"}

},

"context": [{"value": "OperationOutcome"}],

"code": {"value": "issue-source"}

}

],

"description": {"value": "Extensions defined by the build tools. These extensions are candidates for being elevated into the core"},

"name": {"value": "Extensions defined by the FHIR build tools"},

"telecom": [{

"system": {"value": "url"},

"value": {"value": "http://hl7.org/fhir"}

}],

"binding": [{

"referenceResource": {

"type": {"value": "ValueSet"},

"reference": {"value": "#v1"}

},

"name": {"value": "OperationOutcomeSource"},

"isExtensible": {"value": "true"},

"conformance": {"value": "preferred"}

}],

"contained": [{"ValueSet": {

"define": {

"concept": [

{

"definition": {"value": "The error comes from the publication example validator (only in the build process)"},

"display": {"value": "ExampleValidator"},

"code": {"value": "ExampleValidator"}

},

{

"definition": {"value": "The error comes from the code that checks that profiles are valid"},

"display": {"value": "ProfileValidator"},

"code": {"value": "ProfileValidator"}

},

{

"definition": {"value": "The error comes from the code the validates the basic resource definitions"},

"display": {"value": "ResourceValidator"},

"code": {"value": "ResourceValidator"}

},

{

"definition": {"value": "The error comes from code that checks instances against the base profiles and any additional identified profiles"},

"display": {"value": "InstanceValidator"},

"code": {"value": "InstanceValidator"}

},

{

"definition": {"value": "The error comes from checking the instance against the schemas"},

"display": {"value": "Schema"},

"code": {"value": "Schema"}

},

{

"definition": {"value": "The error comes from checking the instance against the invariants defined in the specification"},

"display": {"value": "Schematron"},

"code": {"value": "Schematron"}

}

],

"system": {"value": "http://hl7.org/fhir/operation-outcome-source"},

"caseSensitive": {"value": "true"}

},

"\_id": "v1",

"status": {"value": "draft"},

"description": {"value": "Where in the code - schema, schematron, or validator - an error message comes from"},

"name": {"value": "OperationOutcomeSource"}

}}],

"date": {"value": "2013-07-07"},

"identifier": {"value": "http://hl7.org/fhir/tools/extensions"},

"publisher": {"value": "FHIR Project Team"}

}}

## 4.44: Examples: Provenance

Examples for the [Provenance (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) resource.

#### 4.44.0.55: General

Example of provenance

Example of provenance (id = "example")

<Provenance xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Authored on 8-Nov 2011 by Grahame Grieve. Content extracted from ISO-21090**</div>

</text>

<target>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example/history/@1](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</target>

<!-- nominal activity: editing the standard -->

<activity>

<period>

<start value="2011-06-23"/>

</period>

<recorded value="2012-11-08T23:16:03+11:00"/>

<reason>

<text value="Editing the FHIR Specification"/>

</reason>

<location>

<type value="[Location](http://hl7.org/implement/standards/fhir/fhir-book.htm#location)"/>

<reference value="[location/@2](http://hl7.org/implement/standards/fhir/fhir-book.htm#location-example-room)"/>

</location>

</activity>

<!-- author -->

<party>

<role>

<system value="http://hl7.org/fhir/provenance-participant-role"/>

<code value="author"/>

</role>

<type>

<system value="http://hl7.org/fhir/provenance-participant-type"/>

<code value="person"/>

</type>

<identifier value="mailto:grahame@healthintersections.com.au"/>

<description value="Grahame Grieve"/>

</party>

<!-- actually, this example was extracted from ISO 21090 -->

<party>

<role>

<system value="http://hl7.org/fhir/provenance-participant-role"/>

<code value="source"/>

</role>

<type>

<system value="http://hl7.org/fhir/provenance-participant-type"/>

<code value="document"/>

</type>

<identifier value="urn:iso:std:21090"/>

<description value="ISO 21090"/>

</party>

</Provenance>

JSON Equivalent

Example of provenance

{"Provenance": {

"text": {

"status": {"value": "generated"},

"div": "<div>Authored on 8-Nov 2011 by Grahame Grieve. Content extracted from ISO-21090<\/div>"

},

"target": [{

"type": {"value": "Patient"},

"reference": {"value": "patient/@example/history/@1"}

}],

"party": [

{

"description": {"value": "Grahame Grieve"},

"role": {

"system": {"value": "http://hl7.org/fhir/provenance-participant-role"},

"code": {"value": "author"}

},

"type": {

"system": {"value": "http://hl7.org/fhir/provenance-participant-type"},

"code": {"value": "person"}

},

"identifier": {"value": "mailto:grahame@healthintersections.com.au"}

},

{

"description": {"value": "ISO 21090"},

"role": {

"system": {"value": "http://hl7.org/fhir/provenance-participant-role"},

"code": {"value": "source"}

},

"type": {

"system": {"value": "http://hl7.org/fhir/provenance-participant-type"},

"code": {"value": "document"}

},

"identifier": {"value": "urn:iso:std:21090"}

}

],

"activity": {

"location": {

"type": {"value": "Location"},

"reference": {"value": "location/@2"}

},

"reason": {"text": {"value": "Editing the FHIR Specification"}},

"recorded": {"value": "2012-11-08T23:16:03+11:00"},

"period": {"start": {"value": "2011-06-23"}}

}

}}

## 4.45: Examples: Query

Examples for the [Query (§2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query) resource.

#### 4.45.0.56: Simple

Simple example

Simple example (id = "1")

<Query xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**[Put rendering here]**</div>

</text>

<!-- this is an extremely simple query - a request to execute the query 'example' on the responder -->

<identifier value="urn:uuid:42b253f5-fa17-40d0-8da5-44aeb4230376"/>

<parameter>

<url value="http://hl7.org/fhir/query#\_query"/>

<valueString value="example"/>

</parameter>

</Query>

JSON Equivalent

Simple example

{"Query": {

"text": {

"status": {"value": "generated"},

"div": "<div>[Put rendering here]<\/div>"

},

"parameter": [{

"valueString": {"value": "example"},

"url": {"value": "http://hl7.org/fhir/query#\_query"}

}],

"identifier": {"value": "urn:uuid:42b253f5-fa17-40d0-8da5-44aeb4230376"}

}}

## 4.46: Examples: Questionnaire

Examples for the [Questionnaire (§3.40)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire) resource.

#### 4.46.0.57: General

General questionnaire example

General questionnaire example (id = "3141")

<Questionnaire xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<pre>

**Comorbidity? YES**

**Cardial Comorbidity? YES**

**Angina? YES**

**MI? NO**

**Vascular Comorbidity?**

**(no answers)**

**...**

**Histopathology**

**Abdominal**

**pT category: 1**

**...**

</pre>

</div>

</text>

<contained>

<Patient id="patsub">

<identifier>

<system value="http://cancer.questionnaire.org/systems/id/patientnr"/>

<key value="A34442332"/>

</identifier>

<identifier>

<label value="Dutch BSN"/>

<system value="urn:oid:2.16.840.1.113883.2.4.6.3"/>

<key value="188912345"/>

</identifier>

<gender>

<coding>

<system value="http://hl7.org/fhir/v3/AdministrativeGender"/>

<code value="M"/>

</coding>

</gender>

<birthDate value="1972-11-30"/>

</Patient>

</contained>

<contained>

<Practitioner id="questauth">

<identifier>

<label value="AUMC, Den Helder"/>

<system value="http://cancer.questionnaire.org/systems/id/org"/>

<key value="AUMC"/>

</identifier>

</Practitioner>

</contained>

<contained>

<Observation id="obs.pt-category">

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/questions"/>

<code value="53786006"/>

<display value="pT1 category"/>

</coding>

</name>

<status value="final"/>

<reliability value="unknown"/>

</Observation>

</contained>

<status value="final"/>

<authored value="2013-02-19T14:15:00"/>

<subject>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="#patsub"/>

</subject>

<author>

<type value="[Practitioner](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner)"/>

<reference value="#questauth"/>

</author>

<name>

<text value="Cancer Quality Forum Questionnaire 2012"/>

</name>

<group>

<!-- COMORBIDITY -->

<!-- First main section of the form, questions about comorbidity -->

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/sections"/>

<code value="COMORBIDITY"/>

</coding>

</name>

<!-- section contains one question: whether there is comorbidity -->

<question>

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/questions"/>

<code value="COMORB"/>

</coding>

</name>

<choice>

<system value="http://cancer.questionnaire.org/system/code/yesno"/>

<code value="1"/>

<display value="Yes"/>

</choice>

</question>

<group>

<!-- COMORBIDITY/CARDIAL -->

<!-- Subsection about specific comorbidity: cardial -->

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/sections"/>

<code value="CARDIAL"/>

</coding>

</name>

<question>

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/questions"/>

<code value="COMORBCAR"/>

</coding>

</name>

<choice>

<system value="http://cancer.questionnaire.org/system/code/yesno"/>

<code value="1"/>

</choice>

</question>

<question>

<!-- This answer carries both the questionnaire-specific name and an equivalent SNOMED-CT code -->

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/questions"/>

<code value="COMCAR00"/>

<display value="Angina Pectoris"/>

</coding>

<coding>

<system value="http://snomed.info"/>

<code value="194828000"/>

<display value="Angina (disorder)"/>

</coding>

</name>

<choice>

<system value="http://cancer.questionnaire.org/system/code/yesno"/>

<code value="1"/>

</choice>

</question>

<question>

<name>

<coding>

<system value="http://snomed.info"/>

<code value="22298006"/>

<display value="Myocardial infarction (disorder)"/>

</coding>

</name>

<choice>

<system value="http://cancer.questionnaire.org/system/code/yesno"/>

<code value="0"/>

</choice>

</question>

</group>

<!-- COMORBIDITY/CARDIAL -->

<group>

<!-- COMORBIDITY/VASCULAR -->

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/sections"/>

<code value="VASCULAR"/>

</coding>

</name>

</group>

<!-- COMORBIDITY/VASCULAR -->

</group>

<!-- COMORBIDITY -->

<group>

<!-- HISTOPATHOLOGY -->

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/sections"/>

<code value="HISTOPATHOLOGY"/>

</coding>

</name>

<group>

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/sections"/>

<code value="ABDOMINAL"/>

</coding>

</name>

<question>

<name>

<coding>

<system value="http://cancer.questionnaire.org/system/code/questions"/>

<code value="STADPT"/>

<display value="pT category"/>

</coding>

</name>

<dataResource>

<type value="Observation"/>

<reference value="#obs.pt-category"/>

</dataResource>

</question>

</group>

</group>

<!-- HISTOPATHOLOGY -->

</Questionnaire>

JSON Equivalent

General questionnaire example

{"Questionnaire": {

"author": {

"type": {"value": "Practitioner"},

"reference": {"value": "#questauth"}

},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <pre>\n Comorbidity? YES\n Cardial Comorbidity? YES\n Angina? YES\n MI? NO\n Vascular Comorbidity?\n (no answers)\n ...\n Histopathology\n Abdominal\n pT category: 1\n ...\n <\/pre>\n <\/div>"

},

"authored": {"value": "2013-02-19T14:15:00"},

"status": {"value": "final"},

"subject": {

"type": {"value": "Patient"},

"reference": {"value": "#patsub"}

},

"name": {"text": {"value": "Cancer Quality Forum Questionnaire 2012"}},

"contained": [

{"Patient": {

"\_id": "patsub",

"gender": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v3/AdministrativeGender"},

"code": {"value": "M"}

}]},

"birthDate": {"value": "1972-11-30"},

"identifier": [

{

"system": {"value": "http://cancer.questionnaire.org/systems/id/patientnr"},

"key": {"value": "A34442332"}

},

{

"system": {"value": "urn:oid:2.16.840.1.113883.2.4.6.3"},

"label": {"value": "Dutch BSN"},

"key": {"value": "188912345"}

}

]

}},

{"Practitioner": {

"\_id": "questauth",

"identifier": [{

"system": {"value": "http://cancer.questionnaire.org/systems/id/org"},

"label": {"value": "AUMC, Den Helder"},

"key": {"value": "AUMC"}

}]

}},

{"Observation": {

"\_id": "obs.pt-category",

"status": {"value": "final"},

"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/questions"},

"display": {"value": "pT1 category"},

"code": {"value": "53786006"}

}]},

"reliability": {"value": "unknown"}

}}

],

"group": [

{

"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/sections"},

"code": {"value": "COMORBIDITY"}

}]},

"question": [{

"choice": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/yesno"},

"display": {"value": "Yes"},

"code": {"value": "1"}

}],

"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/questions"},

"code": {"value": "COMORB"}

}]}

}],

"group": [

{

"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/sections"},

"code": {"value": "CARDIAL"}

}]},

"question": [

{

"choice": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/yesno"},

"code": {"value": "1"}

}],

"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/questions"},

"code": {"value": "COMORBCAR"}

}]}

},

{

"choice": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/yesno"},

"code": {"value": "1"}

}],

"name": {"coding": [

{

"system": {"value": "http://cancer.questionnaire.org/system/code/questions"},

"display": {"value": "Angina Pectoris"},

"code": {"value": "COMCAR00"}

},

{

"system": {"value": "http://snomed.info"},

"display": {"value": "Angina (disorder)"},

"code": {"value": "194828000"}

}

]}

},

{

"choice": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/yesno"},

"code": {"value": "0"}

}],

"name": {"coding": [{

"system": {"value": "http://snomed.info"},

"display": {"value": "Myocardial infarction (disorder)"},

"code": {"value": "22298006"}

}]}

}

]

},

{"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/sections"},

"code": {"value": "VASCULAR"}

}]}}

]

},

{

"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/sections"},

"code": {"value": "HISTOPATHOLOGY"}

}]},

"group": [{

"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/sections"},

"code": {"value": "ABDOMINAL"}

}]},

"question": [{

"name": {"coding": [{

"system": {"value": "http://cancer.questionnaire.org/system/code/questions"},

"display": {"value": "pT category"},

"code": {"value": "STADPT"}

}]},

"dataResource": {

"type": {"value": "Observation"},

"reference": {"value": "#obs.pt-category"}

}

}]

}]

}

]

}}

## 4.47: Examples: RelatedPerson

Examples for the [RelatedPerson (§3.41)](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson) resource.

#### 4.47.0.58: Benedicte

RelatedPerson Benedicte du Marche

RelatedPerson Benedicte du Marche (id = "benedicte")

<RelatedPerson xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<table>

<tbody>

<tr>

<td>**Name**</td>

<td>**Bénédicte du Marché**</td>

</tr>

<tr>

<td>**Address**</td>

<td>**43, Place du Marché Sainte Catherine, 75004 Paris, France**</td>

</tr>

<tr>

<td>**Contacts**</td>

<td>**Phone: +33 (237) 998327**</td>

</tr>

</tbody>

</table>

</div>

</text>

<identifier>

<use value="usual"/>

<label value="INSEE"/>

<system value="urn:oid:1.2.250.1.61"/>

<key value="272117510400399"/>

</identifier>

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</patient>

<relationship>

<coding>

<system value="http://hl7.org/fhir/patient-contact-relationship"/>

<code value="partner"/>

</coding>

<coding>

<system value="http://hl7.org/fhir/v3/RoleCode"/>

<code value="WIFE"/>

</coding>

</relationship>

<name>

<family value="du">

<!-- the &quot;du&quot; part is a family name prefix (VV in iso 21090) -->

<extension>

<url value="http://hl7.org/fhir/profile/@iso-21090#qualifier"/>

<valueCode value="VV"/>

</extension>

</family>

<family value="Marché"/>

<given value="Bénédicte"/>

</name>

<telecom>

<system value="phone"/>

<value value="+33 (237) 998327"/>

</telecom>

<gender>

<coding>

<system value="http://hl7.org/fhir/v3/AdministrativeGender"/>

<code value="F"/>

<display value="Female"/>

</coding>

</gender>

<address>

<line value="43, Place du Marché Sainte Catherine"/>

<city value="Paris"/>

<zip value="75004"/>

<country value="FRA"/>

</address>

<photo>

<contentType value="image/jpeg"/>

<url value="binary/@f016"/>

</photo>

</RelatedPerson>

JSON Equivalent

RelatedPerson Benedicte du Marche

{"RelatedPerson": {

"relationship": {"coding": [

{

"system": {"value": "http://hl7.org/fhir/patient-contact-relationship"},

"code": {"value": "partner"}

},

{

"system": {"value": "http://hl7.org/fhir/v3/RoleCode"},

"code": {"value": "WIFE"}

}

]},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <table>\n <tbody>\n <tr>\n <td>Name<\/td>\n <td>Bénédicte du Marché<\/td>\n <\/tr>\n <tr>\n <td>Address<\/td>\n <td>43, Place du Marché Sainte Catherine, 75004 Paris, France<\/td>\n <\/tr>\n <tr>\n <td>Contacts<\/td>\n <td>Phone: +33 (237) 998327<\/td>\n <\/tr>\n <\/tbody>\n <\/table>\n <\/div>"

},

"patient": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example"}

},

"address": {

"zip": {"value": "75004"},

"line": [{"value": "43, Place du Marché Sainte Catherine"}],

"country": {"value": "FRA"},

"city": {"value": "Paris"}

},

"name": {

"given": [{"value": "Bénédicte"}],

"family": [

{

"extension": [{

"valueCode": {"value": "VV"},

"url": {"value": "http://hl7.org/fhir/profile/@iso-21090#qualifier"}

}],

"value": "du"

},

{"value": "Marché"}

]

},

"telecom": [{

"system": {"value": "phone"},

"value": {"value": "+33 (237) 998327"}

}],

"gender": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v3/AdministrativeGender"},

"display": {"value": "Female"},

"code": {"value": "F"}

}]},

"photo": [{

"contentType": {"value": "image/jpeg"},

"url": {"value": "binary/@f016"}

}],

"identifier": [{

"system": {"value": "urn:oid:1.2.250.1.61"},

"use": {"value": "usual"},

"label": {"value": "INSEE"},

"key": {"value": "272117510400399"}

}]

}}

#### 4.47.0.59: Peter

RelatedPerson Peter Chalmers

RelatedPerson Peter Chalmers (id = "peter")

<RelatedPerson xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<table>

<tbody>

<tr>

<td>**Name**</td>

<td>**Peter Chalmers**</td>

</tr>

<tr>

<td>**Address**</td>

<td>**534 Erewhon, Pleasantville, Vic, 3999**</td>

</tr>

<tr>

<td>**Contacts**</td>

<td>**Work: (03) 5555 6473**</td>

</tr>

</tbody>

</table>

</div>

</text>

<patient>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@animal](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example-animal)"/>

</patient>

<relationship>

<coding>

<system value="http://hl7.org/fhir/patient-contact-relationship"/>

<code value="owner"/>

</coding>

</relationship>

<name>

<use value="official"/>

<family value="Chalmers"/>

<given value="Peter"/>

<given value="James"/>

</name>

<telecom>

<system value="phone"/>

<value value="(03) 5555 6473"/>

<use value="work"/>

</telecom>

<gender>

<coding>

<system value="http://hl7.org/fhir/v3/AdministrativeGender"/>

<code value="M"/>

<display value="Male"/>

</coding>

</gender>

<address>

<use value="home"/>

<line value="534 Erewhon St"/>

<city value="PleasantVille"/>

<state value="Vic"/>

<zip value="3999"/>

</address>

<photo>

<contentType value="image/jpeg"/>

<url value="binary/@f012"/>

</photo>

</RelatedPerson>

JSON Equivalent

RelatedPerson Peter Chalmers

{"RelatedPerson": {

"relationship": {"coding": [{

"system": {"value": "http://hl7.org/fhir/patient-contact-relationship"},

"code": {"value": "owner"}

}]},

"text": {

"status": {"value": "generated"},

"div": "<div>\n <table>\n <tbody>\n <tr>\n <td>Name<\/td>\n <td>Peter Chalmers<\/td>\n <\/tr>\n <tr>\n <td>Address<\/td>\n <td>534 Erewhon, Pleasantville, Vic, 3999<\/td>\n <\/tr>\n <tr>\n <td>Contacts<\/td>\n <td>Work: (03) 5555 6473<\/td>\n <\/tr>\n <\/tbody>\n <\/table>\n <\/div>"

},

"patient": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@animal"}

},

"address": {

"zip": {"value": "3999"},

"state": {"value": "Vic"},

"line": [{"value": "534 Erewhon St"}],

"use": {"value": "home"},

"city": {"value": "PleasantVille"}

},

"name": {

"given": [

{"value": "Peter"},

{"value": "James"}

],

"family": [{"value": "Chalmers"}],

"use": {"value": "official"}

},

"telecom": [{

"system": {"value": "phone"},

"value": {"value": "(03) 5555 6473"},

"use": {"value": "work"}

}],

"gender": {"coding": [{

"system": {"value": "http://hl7.org/fhir/v3/AdministrativeGender"},

"display": {"value": "Male"},

"code": {"value": "M"}

}]},

"photo": [{

"contentType": {"value": "image/jpeg"},

"url": {"value": "binary/@f012"}

}]

}}

## 4.48: Examples: SecurityEvent

Examples for the [SecurityEvent (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) resource.

#### 4.48.0.60: General

General SecurityEvent Example

General SecurityEvent Example (id = "example")

<SecurityEvent xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Application Start for under service login &quot;Grahame&quot; (id: Grahame's Test HL7Connect)**</div>

</text>

<event>

<type>

<coding>

<system value="http://nema.org/dicom/dcid"/>

<code value="110100"/>

<display value="Application Activity"/>

</coding>

</type>

<subtype>

<coding>

<system value="http://nema.org/dicom/dcid"/>

<code value="110120"/>

<display value="Application Start"/>

</coding>

</subtype>

<action value="E"/>

<dateTime value="2012-10-25T22:04:27+11:00"/>

<outcome value="0"/>

</event>

<participant>

<role>

<text value="Service User (Logon)"/>

</role>

<userId value="Grahame"/>

<requestor value="false"/>

<network>

<identifier value="127.0.0.1"/>

<type value="ip"/>

</network>

</participant>

<source>

<site value="Development"/>

<identifier value="Grahame's Laptop"/>

<type>

<system value="http://hl7.org/fhir/security-event-sub-type"/>

<code value="1"/>

</type>

</source>

<object>

<!-- todo: get a better code -->

<identifier>

<label value="Dell Serial Number"/>

<key value="ABCDEF"/>

</identifier>

<role value="4"/>

<lifecycle value="6"/>

<name value="Grahame's Test HL7Connect"/>

</object>

</SecurityEvent>

JSON Equivalent

General SecurityEvent Example

{"SecurityEvent": {

"text": {

"status": {"value": "generated"},

"div": "<div>Application Start for under service login &quot;Grahame&quot; (id: Grahame's Test HL7Connect)<\/div>"

},

"source": {

"site": {"value": "Development"},

"type": [{

"system": {"value": "http://hl7.org/fhir/security-event-sub-type"},

"code": {"value": "1"}

}],

"identifier": {"value": "Grahame's Laptop"}

},

"event": {

"dateTime": {"value": "2012-10-25T22:04:27+11:00"},

"subtype": [{"coding": [{

"system": {"value": "http://nema.org/dicom/dcid"},

"display": {"value": "Application Start"},

"code": {"value": "110120"}

}]}],

"action": {"value": "E"},

"type": {"coding": [{

"system": {"value": "http://nema.org/dicom/dcid"},

"display": {"value": "Application Activity"},

"code": {"value": "110100"}

}]},

"outcome": {"value": "0"}

},

"participant": [{

"userId": {"value": "Grahame"},

"role": [{"text": {"value": "Service User (Logon)"}}],

"network": {

"type": {"value": "ip"},

"identifier": {"value": "127.0.0.1"}

},

"requestor": {"value": "false"}

}],

"object": [{

"lifecycle": {"value": "6"},

"name": {"value": "Grahame's Test HL7Connect"},

"role": {"value": "4"},

"identifier": {

"label": {"value": "Dell Serial Number"},

"key": {"value": "ABCDEF"}

}

}]

}}

#### 4.48.0.61: Login

Login example

Login example (id = "example-login")

<SecurityEvent xmlns="http://hl7.org/fhir">

<event>

<type>

<coding>

<system value="http://nema.org/dicom/dcid"/>

<code value="110114"/>

<display value="User Authentication"/>

</coding>

</type>

<subtype>

<coding>

<system value="http://nema.org/dicom/dcid"/>

<code value="110122"/>

<display value="Login"/>

</coding>

</subtype>

<action value="E"/>

<dateTime value="2013-06-20T23:41:23Z"/>

<outcome value="0"/>

</event>

<participant>

<userId value="95"/>

<authId value="601847123"/>

<name value="Grahame Grieve"/>

<requestor value="true"/>

<network>

<identifier value="127.0.0.1"/>

<type value="ip"/>

</network>

</participant>

<source>

<site value="Cloud"/>

<identifier value="hl7connect.healthintersections.com.au"/>

<type>

<system value="http://hl7.org/fhir/security-source-type"/>

<code value="3"/>

<display value="Web Server"/>

</type>

</source>

</SecurityEvent>

JSON Equivalent

Login example

{"SecurityEvent": {

"source": {

"site": {"value": "Cloud"},

"type": [{

"system": {"value": "http://hl7.org/fhir/security-source-type"},

"display": {"value": "Web Server"},

"code": {"value": "3"}

}],

"identifier": {"value": "hl7connect.healthintersections.com.au"}

},

"event": {

"dateTime": {"value": "2013-06-20T23:41:23Z"},

"subtype": [{"coding": [{

"system": {"value": "http://nema.org/dicom/dcid"},

"display": {"value": "Login"},

"code": {"value": "110122"}

}]}],

"action": {"value": "E"},

"type": {"coding": [{

"system": {"value": "http://nema.org/dicom/dcid"},

"display": {"value": "User Authentication"},

"code": {"value": "110114"}

}]},

"outcome": {"value": "0"}

},

"participant": [{

"authId": {"value": "601847123"},

"name": {"value": "Grahame Grieve"},

"userId": {"value": "95"},

"network": {

"type": {"value": "ip"},

"identifier": {"value": "127.0.0.1"}

},

"requestor": {"value": "true"}

}]

}}

#### 4.48.0.62: Logout

Logout example

Logout example (id = "example-logout")

<SecurityEvent xmlns="http://hl7.org/fhir">

<event>

<type>

<coding>

<system value="http://nema.org/dicom/dcid"/>

<code value="110114"/>

<display value="User Authentication"/>

</coding>

</type>

<subtype>

<coding>

<system value="http://nema.org/dicom/dcid"/>

<code value="110123"/>

<display value="Logout"/>

</coding>

</subtype>

<action value="E"/>

<dateTime value="2013-06-20T23:46:41Z"/>

<outcome value="0"/>

</event>

<participant>

<userId value="95"/>

<authId value="601847123"/>

<name value="Grahame Grieve"/>

<requestor value="true"/>

<network>

<identifier value="127.0.0.1"/>

<type value="ip"/>

</network>

</participant>

<source>

<site value="Cloud"/>

<identifier value="hl7connect.healthintersections.com.au"/>

<type>

<system value="http://hl7.org/fhir/security-source-type"/>

<code value="3"/>

<display value="Web Server"/>

</type>

</source>

</SecurityEvent>

JSON Equivalent

Logout example

{"SecurityEvent": {

"source": {

"site": {"value": "Cloud"},

"type": [{

"system": {"value": "http://hl7.org/fhir/security-source-type"},

"display": {"value": "Web Server"},

"code": {"value": "3"}

}],

"identifier": {"value": "hl7connect.healthintersections.com.au"}

},

"event": {

"dateTime": {"value": "2013-06-20T23:46:41Z"},

"subtype": [{"coding": [{

"system": {"value": "http://nema.org/dicom/dcid"},

"display": {"value": "Logout"},

"code": {"value": "110123"}

}]}],

"action": {"value": "E"},

"type": {"coding": [{

"system": {"value": "http://nema.org/dicom/dcid"},

"display": {"value": "User Authentication"},

"code": {"value": "110114"}

}]},

"outcome": {"value": "0"}

},

"participant": [{

"authId": {"value": "601847123"},

"name": {"value": "Grahame Grieve"},

"userId": {"value": "95"},

"network": {

"type": {"value": "ip"},

"identifier": {"value": "127.0.0.1"}

},

"requestor": {"value": "true"}

}]

}}

#### 4.48.0.63: RESTful Operation

RESTful Operation

RESTful Operation (id = "example-rest")

<SecurityEvent xmlns="http://hl7.org/fhir">

<event>

<type>

<coding>

<system value="http://hl7.org/fhir/security-event-type"/>

<code value="rest"/>

<display value="Restful Operation"/>

</coding>

</type>

<subtype>

<coding>

<system value="http://hl7.org/fhir/restful-operation"/>

<code value="vread"/>

<display value="vread"/>

</coding>

</subtype>

<action value="R"/>

<dateTime value="2013-06-20T23:42:24Z"/>

<outcome value="0"/>

</event>

<participant>

<userId value="95"/>

<authId value="601847123"/>

<name value="Grahame Grieve"/>

<requestor value="true"/>

<network>

<type value="ip"/>

</network>

</participant>

<source>

<site value="Cloud"/>

<identifier value="hl7connect.healthintersections.com.au"/>

<type>

<system value="http://hl7.org/fhir/security-source-type"/>

<code value="3"/>

<display value="Web Server"/>

</type>

</source>

<object>

<reference>

<type value="[Patient](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient)"/>

<reference value="[patient/@example/history/@1](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient-example)"/>

</reference>

<type value="2"/>

<lifecycle value="6"/>

</object>

</SecurityEvent>

JSON Equivalent

RESTful Operation

{"SecurityEvent": {

"source": {

"site": {"value": "Cloud"},

"type": [{

"system": {"value": "http://hl7.org/fhir/security-source-type"},

"display": {"value": "Web Server"},

"code": {"value": "3"}

}],

"identifier": {"value": "hl7connect.healthintersections.com.au"}

},

"event": {

"dateTime": {"value": "2013-06-20T23:42:24Z"},

"subtype": [{"coding": [{

"system": {"value": "http://hl7.org/fhir/restful-operation"},

"display": {"value": "vread"},

"code": {"value": "vread"}

}]}],

"action": {"value": "R"},

"type": {"coding": [{

"system": {"value": "http://hl7.org/fhir/security-event-type"},

"display": {"value": "Restful Operation"},

"code": {"value": "rest"}

}]},

"outcome": {"value": "0"}

},

"participant": [{

"authId": {"value": "601847123"},

"name": {"value": "Grahame Grieve"},

"userId": {"value": "95"},

"network": {"type": {"value": "ip"}},

"requestor": {"value": "true"}

}],

"object": [{

"lifecycle": {"value": "6"},

"type": {"value": "2"},

"reference": {

"type": {"value": "Patient"},

"reference": {"value": "patient/@example/history/@1"}

}

}]

}}

## 4.49: Examples: Specimen

Examples for the [Specimen (§3.43)](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen) resource.

## 4.50: Examples: Substance

Examples for the [Substance (§3.44)](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance) resource.

#### 4.50.0.64: Apitoxin

General Person Example

General Person Example (id = "example")

<Substance xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">**Apitoxin (known as Honey Bee Venom)**</div>

</text>

<name value="apitoxin"/>

</Substance>

JSON Equivalent

General Person Example

{"Substance": {

"text": {

"status": {"value": "generated"},

"div": "<div>Apitoxin (known as Honey Bee Venom)<\/div>"

},

"name": {"value": "apitoxin"}

}}

## 4.51: Examples: Supply

Examples for the [Supply (§3.45)](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply) resource.

## 4.52: Examples: ValueSet

Examples for the [ValueSet (§3.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset) resource.

#### 4.52.0.65: General

General ValueSet Example

General ValueSet Example (id = "101")

<ValueSet xmlns="http://hl7.org/fhir">

<text>

<status value="generated"/>

<div xmlns="http://www.w3.org/1999/xhtml">

<p>**Value set &quot;Loinc Codes for Cholesterol&quot;: This is an example value set that includes**

**all the LOINC codes for serum cholesterol from v2.36.**

**Developed by: FHIR project team (example)**</p>

<p>**Published for testing on 13-June 2012**</p>

<p>**This is a restriction on**

<a href="http://hl7.org/svc/fhir/valueset/@03acace4-5206-4c8f-a8b4-df27a4c18b09?format=text/html">

**the value set &quot;all serum test codes&quot;**</a>**, and contains the following LOINC codes:**</p>

<ul>

<li>**14647-2**</li>

<li>**2093-3**</li>

<li>**35200-5**</li>

<li>**9342-7**</li>

</ul>

</div>

</text>

<!-- this example, we elected to use a UUID. We could have used

an OID, or a URI - depends on how it will be used. -->

<identifier value="256a5231-a2bb-49bd-9fea-f349d428b70d"/>

<!-- for version, we are going to simply use the day of publication. This is also

arbitrary - whatever is here is what people use to refer to the version.

Could also be a UUID too -->

<version value="20120613"/>

<!-- set of loinc codes for cholesterol for LONC 2.36 -->

<name value="Loinc Codes for Cholesterol"/>

<publisher value="FHIR project team (example)"/>

<telecom>

<system value="url"/>

<value value="http://hl7.org/fhir"/>

</telecom>

<description value="This is an example value set that includes all the LOINC codes for serum cholesterol from v2.36"/>

<status value="draft"/>

<experimental value="true"/>

<date value="2012-06-13"/>

<compose>

<!-- we claim that this value set is a constraint on this other value set

this actual URL is a reference to a fictitious value set definition on a

fictitious FHIR value set registry. We claim here, simply for illustrative

purposes, that the value set referred to here is all LOINC codes for serum

tests, and that this value set is therefore a constraint on that one

Currently this is not included in the resource pending further investigation

&lt;restricts value=&quot;http://hl7.org/svc/fhir/valueset/@03acace4-5206-4c8f-a8b4-df27a4c18b09&quot;/&gt; -->

<!-- given that this value set is small, it doesn't make

sense to import another one - what would it say? But if that made sense,

we'd do it like this:

&lt;import&gt;http://hl7.org/svc/fhir/valueset/@f0f65621-ae8c-4c57-9f96-5326c2acefe3&lt;/import&gt; -->

<!-- you could have multiple includes, if you wanted to include codes from more than

one code system, or include codes with different modes. we don't, in this case -->

<include>

<system value="http://loinc.org"/>

<version value="2.36"/>

<!-- for LOINC, we simply include the listed codes - no subsumption in LOINC -->

<!-- these were selected by hand -->

<code value="14647-2"/>

<code value="2093-3"/>

<code value="35200-5"/>

<code value="9342-7"/>

</include>

</compose>

</ValueSet>

JSON Equivalent

General ValueSet Example

{"ValueSet": {

"text": {

"status": {"value": "generated"},

"div": "<div>\n <p>Value set &quot;Loinc Codes for Cholesterol&quot;: This is an example value set that includes \n all the LOINC codes for serum cholesterol from v2.36. \n Developed by: FHIR project team (example)<\/p>\n <p>Published for testing on 13-June 2012<\/p>\n <p>This is a restriction on\n<a href=\"http://hl7.org/svc/fhir/valueset/@03acace4-5206-4c8f-a8b4-df27a4c18b09?format=text/html\">\n the value set &quot;all serum test codes&quot;<\/a>, and contains the following LOINC codes:<\/p>\n <ul>\n <li>14647-2<\/li>\n <li>2093-3<\/li>\n <li>35200-5<\/li>\n <li>9342-7<\/li>\n <\/ul>\n <\/div>"

},

"status": {"value": "draft"},

"description": {"value": "This is an example value set that includes all the LOINC codes for serum cholesterol from v2.36"},

"name": {"value": "Loinc Codes for Cholesterol"},

"telecom": [{

"system": {"value": "url"},

"value": {"value": "http://hl7.org/fhir"}

}],

"compose": {"include": [{

"system": {"value": "http://loinc.org"},

"code": [

{"value": "14647-2"},

{"value": "2093-3"},

{"value": "35200-5"},

{"value": "9342-7"}

],

"version": {"value": "2.36"}

}]},

"experimental": {"value": "true"},

"date": {"value": "2012-06-13"},

"identifier": {"value": "256a5231-a2bb-49bd-9fea-f349d428b70d"},

"publisher": {"value": "FHIR project team (example)"},

"version": {"value": "20120613"}

}}

# 5: Formal Definitions

### 5.1.1: Terminology Bindings

This table contains a list of all the terminology bindings in FHIR.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Definition** | **Type** | **Reference** |
| ActImmunizationReason | The reason why a vaccine was administered | ?? | ?? |
| ActNoImmunizationReason | The reason why a vaccine administration was refused | ?? | ?? |
| AddressUse | The use of an address | Code List | [http://hl7.org/fhir/address-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#address-use) |
| AdministrativeGender | The gender of a person used for administrative purposes | Value Set | [http://hl7.org/fhir/vs/administrative-gender (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender) |
| AdmitSource | Where the patient was admitted from | Value Set | [http://hl7.org/fhir/vs/encounter-admit-source (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-admit-source) |
| AdverseEventReportType | Classifies an adverse event report | ?? | ?? |
| AlertStatus | Indicates whether this alert is active and needs to be displayed to a user, or whether it is no longer needed or entered in error | Code List | [http://hl7.org/fhir/alert-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-status) |
| AnimalBreed | The breed of an animal | Value Set (Example Only) | [http://hl7.org/fhir/vs/animal-breeds (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-breeds) |
| AnimalGenderStatus | The state of the animal's reproductive organs | Value Set (Example Only) | [http://hl7.org/fhir/vs/animal-genderstatus (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-genderstatus) |
| AnimalSpecies | The species of an animal | Value Set (Example Only) | [http://hl7.org/fhir/vs/animal-species (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-species) |
| ApproachSite | Identifies the site where the medicine enters the body | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| Arrangements | Special arrangements | Value Set | [http://hl7.org/fhir/vs/encounter-special-arrangements (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-special-arrangements) |
| BindingConformance | Must applications comply with this binding? | Code List | [http://hl7.org/fhir/binding-conformance](http://hl7.org/implement/standards/fhir/fhir-book.htm#binding-conformance) |
| BodySite | Codes describing anatomical locations. May include laterality | Value Set (Example Only) | [http://hl7.org/fhir/vs/body-site (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site) |
| CarePlanActivityCategory | High-level categorization of the type of activity in a care plan. | Code List | [http://hl7.org/fhir/care-plan-activity-category](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-category) |
| CarePlanActivityCode | Detailed description of the type of activity. E.g. What lab test, what procedure, what kind of encounter. | ?? | ?? |
| CarePlanActivityStatus | Indicates where the activity is at in its overall life cycle | Code List | [http://hl7.org/fhir/care-plan-activity-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-status) |
| CarePlanGoalStatus | Indicates whether the goal has been met and is still being targeted | Code List | [http://hl7.org/fhir/care-plan-goal-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-goal-status) |
| CarePlanParticipantRole | Indicates specific responsibility of an individual within the care plan. E.g. "Primary physician", "Team coordinator", "Caregiver", etc. | ?? | ?? |
| CarePlanStatus | Indicates whether the plan is currently being acted upon, represents future intentions or is now just historical record. | Code List | [http://hl7.org/fhir/care-plan-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-status) |
| CausalityExpectation | How likely is it that the given exposure caused a reaction | Code List | [http://hl7.org/fhir/causalityExpectation](http://hl7.org/implement/standards/fhir/fhir-book.htm#causalityExpectation) |
| ConditionCategory | A category assigned to the condition. E.g. finding | Condition | diagnosis | concern | condition | Value Set | [http://hl7.org/fhir/vs/condition-category (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-category) |
| ConditionCertainty | The degree of confidence that this condition is correct | Value Set (Example Only) | [http://hl7.org/fhir/vs/condition-certainty (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-certainty) |
| ConditionCode | Identification of the Condition or diagnosis. | Value Set (Example Only) | [http://hl7.org/fhir/vs/condition-code (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-code) |
| ConditionFinding | Identification of issue that is a cause or a precedent of a Condition or diagnosis. | Value Set (Example Only) | [http://hl7.org/fhir/vs/condition-code (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-code) |
| ConditionOutcome | The result of the condition for the patient. E.g. death, permanent disability, temporary disability, etc. | ?? | ?? |
| ConditionRelationshipType | The type of relationship between a condition and its related item | Code List | [http://hl7.org/fhir/condition-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-relationship-type) |
| ConditionSeverity | A subjective assessment of the severity of the condition as evaluated by the clinician. | Value Set (Example Only) | [http://hl7.org/fhir/vs/condition-severity (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-severity) |
| ConditionStatus | The clinical status of the Condition or diagnosis | Code List | [http://hl7.org/fhir/condition-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-status) |
| ConformanceEventMode | The mode of a message conformance statement | Code List | [http://hl7.org/fhir/message-conformance-event-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-conformance-event-mode) |
| ConformanceStatementStatus | The status of this conformance statement | Code List | [http://hl7.org/fhir/conformance-statement-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-statement-status) |
| ConstraintSeverity | Must applications comply with this constraint? | Code List | [http://hl7.org/fhir/constraint-severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#constraint-severity) |
| ContactPartyType | The purpose for which you would contact a contact party | Value Set | [http://hl7.org/fhir/vs/contactentity-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-contactentity-type) |
| ContactRelationship | The nature of the relationship between a patient and a contactperson for that patient | Value Set | [http://hl7.org/fhir/vs/patient-contact-relationship (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-patient-contact-relationship) |
| ContactSystem | What kind of contact this is | Code List | [http://hl7.org/fhir/contact-system](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-system) |
| ContactUse | How to use this address | Code List | [http://hl7.org/fhir/contact-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-use) |
| Courtesies | Special courtesies | Value Set | [http://hl7.org/fhir/vs/encounter-special-courtesy (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-special-courtesy) |
| CoverageType | The type of insurance: public health, worker compensation; private accident, auto, private health, etc.) | Value Set | [http://hl7.org/fhir/v3/vs/ActCoverageTypeCode (http://hl7.org/fhirv3/ActCoverageTypeCode/index.htm)](http://hl7.org/fhirv3/ActCoverageTypeCode/index.htm) |
| Criticality | The criticality of an adverse sensitivity | Code List | [http://hl7.org/fhir/criticality](http://hl7.org/implement/standards/fhir/fhir-book.htm#criticality) |
| DataType | The type of an element - one of the FHIR data types | Code List | [http://hl7.org/fhir/data-types.htm (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#data-types) |
| DeviceChannelKind | Describes the channel | ?? | ?? |
| DeviceCompartmentKind | Describes the compartment | ?? | ?? |
| DeviceDataType | The type of data produced by a device | Code List | [http://hl7.org/fhir/device-data-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-data-type) |
| DeviceFacetCode | Describes the facet | Reference | [http://loinc.org](http://loinc.org/) |
| DeviceKind | Defines the nature of the device and the kind of functionality/services/behavior that may be expected from it | ?? | ?? |
| DeviceMetricsCode | Describes the metrics | ?? | ?? |
| DeviceValueFlag | Flags that supply information about the status of a device reading | Code List | [http://hl7.org/fhir/device-value-flag](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-value-flag) |
| DiagnosisCodes | Diagnoses codes provided as adjuncts to the report | Value Set (Example Only) | [http://hl7.org/fhir/vs/clinical-findings (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-clinical-findings) |
| DiagnosticOrderStatus | The status of a diagnostic order | Code List | [http://hl7.org/fhir/diagnostic-order-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) |
| DiagnosticRequests | codes for tests/services that can be performed by diagnostic services | Value Set (Example Only) | [http://hl7.org/fhir/vs/diagnostic-requests (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-requests) |
| DiagnosticResultGroupNames | DiagnosticResultGroupNames | Value Set | [http://hl7.org/fhir/vs/report-names (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-report-names) |
| DiagnosticServiceSection | codes for diagnostic service sections | Value Set | [http://hl7.org/fhir/vs/diagnostic-service-sections (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-service-sections) |
| DicomRoleId | Role(s) the user plays (from RBAC) | Value Set | [http://hl7.org/fhir/vs/dicm-402-roleid (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicm-402-roleid) |
| DischargeDisp | Discharge Disposition | Value Set | [http://hl7.org/fhir/vs/encounter-discharge-disposition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-discharge-disposition) |
| DocumentAttestationMode | The way in which a person authenticated a document | Code List | [http://hl7.org/fhir/document-attestation-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-attestation-mode) |
| DocumentConfidentiality | Codes specifying the level of confidentiality of the XDS Document | Value Set (Example Only) | [http://hl7.org/fhir/vs/doc-confidentiality (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-confidentiality) |
| DocumentEventCode | This list of codes represents the main clinical acts being documented | Value Set (Example Only) | [http://hl7.org/fhir/vs/doc-event-code (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-event-code) |
| DocumentFacilityType | XDS Facility Type | Value Set (Example Only) | [http://hl7.org/fhir/vs/xds-facilitycodes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-facilitycodes) |
| DocumentFormat | The format that the source document has | Value Set (Example Only) | [http://hl7.org/fhir/vs/xds-formatcodes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-formatcodes) |
| DocumentMode | Whether the application produces or consumes documents | Code List | [http://hl7.org/fhir/document-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-mode) |
| DocumentReferenceStatus | The status of the document reference | Code List | [http://hl7.org/fhir/document-reference-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-reference-status) |
| DocumentSectionCode | Classification of a clinical document section | Value Set | [http://hl7.org/fhir/vs/doc-section-codes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-section-codes) |
| DocumentServiceType | Document Reference Service Type | Value Set | [http://hl7.org/fhir/vs/documentreference-service-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-documentreference-service-types) |
| DocumentStatus | The workflow/clinical status of this document | Code List | [http://hl7.org/fhir/document-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-status) |
| DocumentSubType | SubType of a clinical document | Value Set (Example Only) | [http://hl7.org/fhir/vs/xds-typecodes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-typecodes) |
| DocumentType | Type of a clinical document | Value Set | [http://hl7.org/fhir/vs/doc-codes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-codes) |
| EncounterClass | Classification of the encounter | Code List | [http://hl7.org/fhir/encounter-class](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-class) |
| EncounterReason | Reason | ?? | ?? |
| EncounterState | Current state of the encounter | Code List | [http://hl7.org/fhir/encounter-state](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-state) |
| EncounterType | The type of encounter | Value Set (Example Only) | [http://hl7.org/fhir/vs/encounter-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-type) |
| EventReason | The reason for an event occurring | ?? | ?? |
| EventTiming | A real world event that a schedule is related to | Code List | [http://hl7.org/fhir/event-timing](http://hl7.org/implement/standards/fhir/fhir-book.htm#event-timing) |
| ExposureType | The type of exposure that resulted in an adverse reaction | Code List | [http://hl7.org/fhir/exposureType](http://hl7.org/implement/standards/fhir/fhir-book.htm#exposureType) |
| ExtensionContext | How an extension context is interpreted | Code List | [http://hl7.org/fhir/extension-context](http://hl7.org/implement/standards/fhir/fhir-book.htm#extension-context) |
| FHIRDefinedType | Either a resource or a data type | Code List | [http://hl7.org/fhir/defined-types.htm (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#defined-types) |
| FamilialRelationship | The nature of the relationship between the patient and the person with the condition. Based on the HL7v3 RoleCode: OID: 2.16.840.1.113883.5.111 with some inappropriate items removed | Value Set | [http://hl7.org/fhir/familial-relationship](http://hl7.org/implement/standards/fhir/fhir-book.htm#familial-relationship) |
| FilterOperator | The kind of operation to perform as part of a property based filter | Code List | [http://hl7.org/fhir/filter-operator](http://hl7.org/implement/standards/fhir/fhir-book.htm#filter-operator) |
| GroupCharacteristicType | List of characteristics used to describe group members. E.g. gender, age, owner, location, etc. | ?? | ?? |
| GroupCharacteristicValue | Value of descriptive member characteristic | ?? | ?? |
| GroupCode | Kind of particular resource | ?? | ?? |
| GroupType | Types of resources that are part of group | Code List | [http://hl7.org/fhir/group-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-type) |
| HierarchicalRelationshipType | Type indicating if this is a parent or child relationship | Code List | [http://hl7.org/fhir/hierarchical-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#hierarchical-relationship-type) |
| IdentifierUse | Identifies the use for this identifier, if known | Code List | [http://hl7.org/fhir/identifier-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#identifier-use) |
| ImagingModality | Type of acquired image data in the instance | Code List | [http://hl7.org/fhir/imaging-modality](http://hl7.org/implement/standards/fhir/fhir-book.htm#imaging-modality) |
| ImmunizationForecastStatus | The patient's status with respect to a vaccintion protocol | Code List | [http://hl7.org/fhir/immunization-forecast-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-forecast-status) |
| ImmunizationProfileDateCriterion | Classifies date criterion with respect to conveying information about a patient's vaccination status (e.g. due date, latest to give date, etc.) | ?? | ?? |
| ImmunizationRoute | The route by which the vaccine was administered | ?? | ?? |
| ImmunizationSite | The site at which the vaccine was administered | ?? | ?? |
| InstanceAvailability | Availability of the resource | Code List | [http://hl7.org/fhir/instance-availability](http://hl7.org/implement/standards/fhir/fhir-book.htm#instance-availability) |
| IssueSeverity | How the issue affects the success of the action | Code List | [http://hl7.org/fhir/issue-severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-severity) |
| IssueType | A coded expression of the type of issue | Value Set | [http://hl7.org/fhir/issue-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-type) |
| Language | A human language | Reference | [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |
| ListCode | What the purpose of a list is | ?? | ?? |
| ListEmptyReason | If a list is empty, why it is empty | ?? | ?? |
| ListItemFlag | Codes that provide further information about the reason and meaning of the item in the list | ?? | ?? |
| ListMode | The processing mode that applies to this list | Code List | [http://hl7.org/fhir/list-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-mode) |
| LocationType | Indicates what kind of location this is. | Value Set (Example Only) | [http://hl7.org/fhir/vs/location-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-location-type) |
| MaritalStatus | The domestic partnership status of a person | Value Set | [http://hl7.org/fhir/vs/marital-status (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-marital-status) |
| MediaSubtype | The type of acquisition equipment/process | Value Set (Example Only) | [http://hl7.org/fhir/vs/media-subtype (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-subtype) |
| MediaType | Whether the Media is a photo, video, or audio | Code List | [http://hl7.org/fhir/media-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-type) |
| MediaView | Imaging view (projection) used when collecting an image | Value Set (Example Only) | [http://hl7.org/fhir/vs/media-view (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-view) |
| MedicationAdministrationMethod | A set of codes indicating the method by which the medication is introduced into or onto the body. | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| MedicationAdministrationNegationReason | A set of codes indicating the reason why the MedicationAdministration is negated. | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| MedicationAdministrationStatus | A set of codes indicating the current status of a MedicationAdministration | Code List | [http://hl7.org/fhir/medication-admin-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-admin-status) |
| MedicationCode | A code that defines the type of a medication | ?? | ?? |
| MedicationContainer | Kind of container a medication package is packaged in | ?? | ?? |
| MedicationDispenseStatus | A code specifying the state of the dispense event. | Code List | [http://hl7.org/fhir/medication-dispense-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-dispense-status) |
| MedicationDispenseSubstitutionReason | Indicates the reason for the substitution of (or lack of substitution) from what was prescribed. | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| MedicationDispenseSubstitutionType | A code signifying whether a different drug was dispensed from what was prescribed. | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| MedicationDispenseType | Indicates the type of dispensing event that is performed. Examples include: Trial Fill, Completion of Trial, Partial Fill, Emergency Fill, Samples, etc. | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| MedicationForm | The form of a medication | ?? | ?? |
| MedicationIntendedSubstitutionReason | Indicates the reason that a different medication should (or should not) be substituted from what was prescribed. | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| MedicationIntendedSubstitutionType | A code signifying whether a different drug should be dispensed from what was prescribed. | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| MedicationKind | Whether the medication is a product or a package | Code List | [http://hl7.org/fhir/medication-kind](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-kind) |
| MedicationPrescriptionStatus | A code specifying the state of the prescribing event. | Code List | [http://hl7.org/fhir/medication-prescription-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-prescription-status) |
| MessageEvent | One of the message events defined as part of FHIR | Code List | [http://hl7.org/fhir/message-events.htm (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-events) |
| MessageTransport | How messages are delivered | Value Set | [http://hl7.org/fhir/message-transport](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-transport) |
| MimeType | The mime type of an attachment | Reference | [BCP 13 (RFCs 2045, 2046, 2047, 4288, 4289 and 2049) (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) |
| Modality | Type of data in the instance | Code List | [http://hl7.org/fhir/modality](http://hl7.org/implement/standards/fhir/fhir-book.htm#modality) |
| NameUse | The use of a human name | Code List | [http://hl7.org/fhir/name-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#name-use) |
| ObservationInterpretation | Codes identifying interpretations of observations | Value Set | [http://hl7.org/fhir/vs/observation-interpretation (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-interpretation) |
| ObservationMethod | Methods for simple observations | Value Set (Example Only) | [http://hl7.org/fhir/vs/observation-methods (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-methods) |
| ObservationRangeMeaning | Code for the meaning of a reference range | Value Set (Example Only) | [http://hl7.org/fhir/vs/referencerange-meaning (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-referencerange-meaning) |
| ObservationReliability | Codes that provide reliability information about an observation | Code List | [http://hl7.org/fhir/observation-reliability](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-reliability) |
| ObservationStatus | Codes providing the status of an observation | Code List | [http://hl7.org/fhir/observation-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) |
| ObservationType | Codes identifying types of simple observations | Value Set | [http://hl7.org/fhir/vs/observation-codes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-codes) |
| OrderOutcomeCode | The status of the response to an order | Code List | [http://hl7.org/fhir/order-outcome-code](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-outcome-code) |
| OrganizationType | Used to categorize the organization | Value Set (Example Only) | [http://hl7.org/fhir/vs/organization-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-organization-type) |
| ParticipantType | Kind of participation | Code List | [http://hl7.org/fhir/participant-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#participant-type) |
| PatientDiet | Medical, cultural or ethical food preferences to help with catering requirements | Value Set | [http://hl7.org/fhir/vs/encounter-diet (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-diet) |
| PatientRelationshipType | The nature of the relationship between a patient and the related person | Value Set (Example Only) | [http://hl7.org/fhir/vs/relatedperson-relationshiptype (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-relatedperson-relationshiptype) |
| PictureType | The type of image in the picture | Code List | [http://hl7.org/fhir/picture-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-type) |
| PractitionerRole | The role a person plays representing an organization | Value Set (Example Only) | [http://hl7.org/fhir/vs/practitioner-role (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-role) |
| PractitionerSpecialty | Specific specialty associated with the agency | Value Set (Example Only) | [http://hl7.org/fhir/vs/practitioner-specialty (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-specialty) |
| PreAdminTest | Tests done before admission | ?? | ?? |
| Priority | Indicates the urgency of the encounter | Value Set (Example Only) | [http://hl7.org/fhir/vs/encounter-priority (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-priority) |
| ProcedureRelationshipType | the nature of the relationship | Code List | [http://hl7.org/fhir/procedure-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-relationship-type) |
| ProvenanceParticipantRole | The role that a provenance participant played | Value Set | [http://hl7.org/fhir/provenance-participant-role](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-role) |
| ProvenanceParticipantType | The type of a provenance participant | Value Set | [http://hl7.org/fhir/provenance-participant-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-type) |
| Qualification | Specific qualification the practitioner has to provide a service | ?? | ?? |
| QuantityCompararator | how the Quantity should be understood and represented | Code List | [http://hl7.org/fhir/quantity-comparator](http://hl7.org/implement/standards/fhir/fhir-book.htm#quantity-comparator) |
| QueryOutcome | The outcome of processing a query request | Code List | [http://hl7.org/fhir/query-outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-outcome) |
| QuestionName | Structured names for questions on the form | Value Set (Example Only) | [http://hl7.org/fhir/vs/questionnaire-question-name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-question-name) |
| QuestionnaireGroupName | Structured names for (sub)sections of forms | Value Set (Example Only) | [http://hl7.org/fhir/vs/questionnaire-group-name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-group-name) |
| QuestionnaireName | Structured names for forms | Value Set (Example Only) | [http://hl7.org/fhir/vs/questionnaire-name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-name) |
| ReactionSeverity | The severity of an adverse reaction. | Code List | [http://hl7.org/fhir/reactionSeverity](http://hl7.org/implement/standards/fhir/fhir-book.htm#reactionSeverity) |
| ReferredDocumentStatus | Status of the underlying document | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#??) |
| RequestedTime | When a requested action should be performed | ?? | ?? |
| ResourceProfileStatus | The lifecycle status of a Resource Profile | Code List | [http://hl7.org/fhir/resource-profile-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-profile-status) |
| ResourceType | One of the resource types defined as part of FHIR | Code List | [http://hl7.org/fhir/resource-types.htm (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) |
| ResponseCode | The kind of response to a message | Code List | [http://hl7.org/fhir/response-code](http://hl7.org/implement/standards/fhir/fhir-book.htm#response-code) |
| RestfulConformanceMode | The mode of a restful conformance statement | Code List | [http://hl7.org/fhir/restful-conformance-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-conformance-mode) |
| RestfulOperation | Operations supported by REST | Code List | [http://hl7.org/fhir/restful-operation](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-operation) |
| RestfulSecurityService | Types of security services used with FHIR | Value Set | [http://hl7.org/fhir/restful-security-service](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-security-service) |
| RouteOfAdministration | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| SearchParamType | Data types allowed to be used for search parameters | Code List | [http://hl7.org/fhir/search-param-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type) |
| SecurityEventAction | Indicator for type of action performed during the event that generated the audit. | Code List | [http://hl7.org/fhir/security-event-action](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) |
| SecurityEventObjectLifecycle | Identifier for the data life-cycle stage for the participant object | Code List | [http://hl7.org/fhir/object-lifecycle](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-lifecycle) |
| SecurityEventObjectRole | Code representing the functional application role of Participant Object being audited | Code List | [http://hl7.org/fhir/object-role](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-role) |
| SecurityEventObjectSensitivity | The sensitivity of an object in a security event resource. May also encompass confidentiality and rudimentary access control | Value Set (Example Only) | [http://hl7.org/fhir/vs/security-event-sensitivity (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sensitivity) |
| SecurityEventObjectType | Code for the participant object type being audited | Code List | [http://hl7.org/fhir/object-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-type) |
| SecurityEventOutcome | Indicates whether the event succeeded or failed | Code List | [http://hl7.org/fhir/security-event-outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-outcome) |
| SecurityEventParticipantNetworkType | the type of network access point that originated the audit event | Code List | [http://hl7.org/fhir/network-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#network-type) |
| SecurityEventSourceType | Code specifying the type of source where event originated | Value Set | [http://hl7.org/fhir/vs/security-source-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-source-type) |
| SecurityEventSubType | Sub-type of event | Value Set | [http://hl7.org/fhir/vs/security-event-sub-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sub-type) |
| SecurityEventType | Type of event | Value Set | [http://hl7.org/fhir/vs/security-event-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-type) |
| SensitivityStatus | The status of the adverse sensitivity | Code List | [http://hl7.org/fhir/sensitivitystatus](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitystatus) |
| SensitivityType | The type of an adverse sensitivity | Code List | [http://hl7.org/fhir/sensitivitytype](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitytype) |
| SlicingRules | How slices are interpreted when evaluating an instance | Code List | [http://hl7.org/fhir/resource-slicing-rules](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-slicing-rules) |
| SpecimenCollectionMethod | The technique that is used to perform the procedure | Value Set | [http://hl7.org/fhir/vs/specimen-collection-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-collection-type) |
| SpecimenContainerType | Type of specimen container | Value Set (Example Only) | [http://hl7.org/fhir/vs/specimen-container-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-container-type) |
| SpecimenTreatmentProcedure | Type indicating the technique used to process the specimen | Value Set | [http://hl7.org/fhir/vs/specimen-treatment-procedure (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-treatment-procedure) |
| SpecimenType | The type of the specimen. This is sometimes called the "matrix" | Value Set | [http://hl7.org/fhir/vs/specimen-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-type) |
| SubstanceQuantityMode | Mode of the quantity element | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| SubstanceStatus | Substance status | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| SubstanceType | Type of the substance | Value Set | [?? (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm) |
| SupplyItemType | The actual item being supplied | Value Set | [http://hl7.org/fhir/vs/supply-item (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-item) |
| SupplyStatus | Status of the supply | Code List | [http://hl7.org/fhir/vs/supply-status (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-status) |
| SupplyType | Category of supply | Value Set | [http://hl7.org/fhir/vs/supply-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-type) |
| SymptomType | The type of symptom. | Reference | [ICD-10 Reaction codes (http://apps.who.int/classifications/icd10/browse/2010/en)](http://apps.who.int/classifications/icd10/browse/2010/en) |
| UCUM | UCUM Codes | Reference | [http://unitsofmeasure.org](http://unitsofmeasure.org/) |
| UnitsOfTime | A unit of time (units from UCUM) | Code List | [http://hl7.org/fhir/units-of-time](http://hl7.org/implement/standards/fhir/fhir-book.htm#units-of-time) |
| VaccinationProtocolDoseStatus | The status of the vaccination protocol (i.e. should this count) | ?? | ?? |
| VaccinationProtocolDoseStatusReason | The reason for the determining if a vaccination should count or why vaccination should not count. | ?? | ?? |
| VaccinationProtocolDoseTarget | The disease target of the vaccination protocol | ?? | ?? |
| VaccineType | The type of vaccine administered | ?? | ? Unbound: Vaccine Product Type Administered |
| ValueSetStatus | The lifecycle status of a Value Set | Code List | [http://hl7.org/fhir/valueset-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-status) |

### 5.2.1: Codes Defined by FHIR v0.10

This table contains a list of all the namespaces that define codes in the FHIR specification. When represented in a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding) data type, the *system* element contains the namespace, and the *code* element contains the defined code. Note that all the codes in these code systems are case sensitive and must be used in lowercase.

Note that some of these codes are defined in value sets that also include codes from other code systems as well.

|  |  |
| --- | --- |
| [http://hl7.org/fhir/address-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#address-use) | The use of an address |
| [http://hl7.org/fhir/admit-source (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-admit-source) | This value set defines a set of codes that can be used to indicate from where the patient came in. |
| [http://hl7.org/fhir/alert-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-status) | Indicates whether this alert is active and needs to be displayed to a user, or whether it is no longer needed or entered in error |
| [http://hl7.org/fhir/animal-breed (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-breeds) | This example value set defines a set of codes that can be used to indicate breeds of species. |
| [http://hl7.org/fhir/animal-genderstatus (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-genderstatus) | This example value set defines a set of codes that can be used to indicate the current state of the animal's reproductive organs. |
| [http://hl7.org/fhir/animal-species (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-species) | This example value set defines a set of codes that can be used to indicate species of animal patients. |
| [http://hl7.org/fhir/answer-format](http://hl7.org/implement/standards/fhir/fhir-book.htm#answer-format) | The expected format of an answer |
| [http://hl7.org/fhir/binding-conformance](http://hl7.org/implement/standards/fhir/fhir-book.htm#binding-conformance) | Must applications comply with this binding? |
| [http://hl7.org/fhir/care-plan-activity-category](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-category) | High-level categorization of the type of activity in a care plan. |
| [http://hl7.org/fhir/care-plan-activity-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-status) | Indicates where the activity is at in its overall life cycle |
| [http://hl7.org/fhir/care-plan-goal-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-goal-status) | Indicates whether the goal has been met and is still being targeted |
| [http://hl7.org/fhir/care-plan-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-status) | Indicates whether the plan is currently being acted upon, represents future intentions or is now just historical record. |
| [http://hl7.org/fhir/causalityExpectation](http://hl7.org/implement/standards/fhir/fhir-book.htm#causalityExpectation) | How likely is it that the given exposure caused a reaction |
| [http://hl7.org/fhir/code-selection-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#code-selection-mode) | The way in which the code is selected |
| [http://hl7.org/fhir/condition-category (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-category) | Example value set for Condition (Problem/Diagnosis) Categories |
| [http://hl7.org/fhir/condition-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-relationship-type) | The type of relationship between a condition and its related item |
| [http://hl7.org/fhir/condition-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-status) | The clinical status of the Condition or diagnosis |
| [http://hl7.org/fhir/conformance-statement-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-statement-status) | The status of this conformance statement |
| [http://hl7.org/fhir/constraint-severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#constraint-severity) | Must applications comply with this constraint? |
| [http://hl7.org/fhir/contact-system](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-system) | What kind of contact this is |
| [http://hl7.org/fhir/contact-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-use) | How to use this address |
| [http://hl7.org/fhir/contactentity-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-contactentity-type) | This example value set defines a set of codes that can be used to indicate the purpose for which you would contact a contact party. |
| [http://hl7.org/fhir/criticality](http://hl7.org/implement/standards/fhir/fhir-book.htm#criticality) | The criticality of an adverse sensitivity |
| [http://hl7.org/fhir/data-absent-reason](http://hl7.org/implement/standards/fhir/fhir-book.htm#data-absent-reason) | Used to specify why the normally expected content of the data element is missing |
| [http://hl7.org/fhir/data-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#data-types) | The type of an element - one of the FHIR data types |
| [http://hl7.org/fhir/defined-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#defined-types) | Either a resource or a data type |
| [http://hl7.org/fhir/device-data-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-data-type) | The type of data produced by a device |
| [http://hl7.org/fhir/device-value-flag](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-value-flag) | Flags that supply information about the status of a device reading |
| [http://hl7.org/fhir/diagnostic-order-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) | The status of a diagnostic order |
| [http://hl7.org/fhir/diet (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-diet) | This value set defines a set of codes that can be used to indicate dietary preferences or restrictions a patient may have. |
| [http://hl7.org/fhir/discharge-disposition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-discharge-disposition) | This value set defines a set of codes that can be used to where the patient left the hospital |
| [http://hl7.org/fhir/document-attestation-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-attestation-mode) | The way in which a person authenticated a document |
| [http://hl7.org/fhir/document-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-mode) | Whether the application produces or consumes documents |
| [http://hl7.org/fhir/document-reference-service-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-documentreference-service-types) | Known Service types that can be referred to from a Document Reference |
| [http://hl7.org/fhir/document-reference-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-reference-status) | The status of the document reference |
| [http://hl7.org/fhir/document-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-status) | The workflow/clinical status of this document |
| [http://hl7.org/fhir/encounter-class](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-class) | Classification of the encounter |
| [http://hl7.org/fhir/encounter-special-arrangements (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-special-arrangements) | This value set defines a set of codes that can be used to indicate the kinds of special arrangements in place for a patients visit |
| [http://hl7.org/fhir/encounter-state](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-state) | Current state of the encounter |
| [http://hl7.org/fhir/encounter-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-type) | This example value set defines a set of codes that can be used to indicate the type of encounter: a specific code indicating type of service provided . |
| [http://hl7.org/fhir/exposureType](http://hl7.org/implement/standards/fhir/fhir-book.htm#exposureType) | The type of exposure that resulted in an adverse reaction |
| [http://hl7.org/fhir/extension-context](http://hl7.org/implement/standards/fhir/fhir-book.htm#extension-context) | How an extension context is interpreted |
| [http://hl7.org/fhir/filter-operator](http://hl7.org/implement/standards/fhir/fhir-book.htm#filter-operator) | The kind of operation to perform as part of a property based filter |
| [http://hl7.org/fhir/group-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-type) | Types of resources that are part of group |
| [http://hl7.org/fhir/hierarchical-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#hierarchical-relationship-type) | Type indicating if this is a parent or child relationship |
| [http://hl7.org/fhir/identifier-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#identifier-use) | Identifies the use for this identifier, if known |
| [http://hl7.org/fhir/immunization-forecast-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-forecast-status) | The patient's status with respect to a vaccintion protocol |
| [http://hl7.org/fhir/issue-severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-severity) | How the issue affects the success of the action |
| [http://hl7.org/fhir/issue-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-type) | A coded expression of the type of issue |
| [http://hl7.org/fhir/list-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-mode) | The processing mode that applies to this list |
| [http://hl7.org/fhir/location-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-location-type) | This example value set defines a set of codes that can be used to indicate a type of location. |
| [http://hl7.org/fhir/marital-status (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-marital-status) | This value set defines the set of codes that can be used to indicate the marital status of a person |
| [http://hl7.org/fhir/media-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-type) | Whether the Media is a photo, video, or audio |
| [http://hl7.org/fhir/medication-admin-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-admin-status) | A set of codes indicating the current status of a MedicationAdministration Tie this into the HL7 V3 Event act state model for administration |
| [http://hl7.org/fhir/medication-dispense-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-dispense-status) | A code specifying the state of the dispense event. Tie this into the HL7 V3 Event act state model for administration |
| [http://hl7.org/fhir/medication-kind](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-kind) | Whether the medication is a product or a package |
| [http://hl7.org/fhir/medication-prescription-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-prescription-status) | A code specifying the state of the prescribing event. Tie this into the HL7 V3 Event act state model for administration |
| [http://hl7.org/fhir/message-conformance-event-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-conformance-event-mode) | The mode of a message conformance statement |
| [http://hl7.org/fhir/message-events (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-events) | One of the message events defined as part of FHIR |
| [http://hl7.org/fhir/message-transport](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-transport) | How messages are delivered |
| [http://hl7.org/fhir/name-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#name-use) | The use of a human name |
| [http://hl7.org/fhir/narrative-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#narrative-status) | The status of a resource narrative |
| [http://hl7.org/fhir/network-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#network-type) | the type of network access point that originated the audit event |
| [http://hl7.org/fhir/object-lifecycle](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-lifecycle) | Identifier for the data life-cycle stage for the participant object |
| [http://hl7.org/fhir/object-role](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-role) | Code representing the functional application role of Participant Object being audited |
| [http://hl7.org/fhir/object-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-type) | Code for the participant object type being audited |
| [http://hl7.org/fhir/observation-reliability](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-reliability) | Codes that provide reliability information about an observation |
| [http://hl7.org/fhir/observation-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) | Codes providing the status of an observation |
| [http://hl7.org/fhir/order-outcome-code](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-outcome-code) | The status of the response to an order |
| [http://hl7.org/fhir/organization-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-organization-type) | This example value set defines a set of codes that can be used to indicate a type of organization. |
| [http://hl7.org/fhir/participant-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#participant-type) | Kind of participation |
| [http://hl7.org/fhir/patient-contact-relationship (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-patient-contact-relationship) | This value set defines a set of codes that are used to indicate the nature of the relationship between a patient and a contactperson for that patient |
| [http://hl7.org/fhir/picture-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-type) | The type of image in the picture |
| [http://hl7.org/fhir/practitioner-role (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-role) | This example value set defines a set of codes that can be used to indicate the role of a Practitioner. |
| [http://hl7.org/fhir/practitioner-specialty (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-specialty) | This example value set defines a set of codes that can be used to indicate the specialty of a Practitioner |
| [http://hl7.org/fhir/procedure-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-relationship-type) | the nature of the relationship |
| [http://hl7.org/fhir/provenance-participant-role](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-role) | The role that a provenance participant played |
| [http://hl7.org/fhir/provenance-participant-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-type) | The type of a provenance participant |
| [http://hl7.org/fhir/quantity-comparator](http://hl7.org/implement/standards/fhir/fhir-book.htm#quantity-comparator) | how the Quantity should be understood and represented |
| [http://hl7.org/fhir/query-outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-outcome) | The outcome of processing a query request |
| [http://hl7.org/fhir/questionnaire-name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-name) | This example value set defines a set of codes that can be used to specify a coded name for a standard Questionnaire. |
| [http://hl7.org/fhir/reactionSeverity](http://hl7.org/implement/standards/fhir/fhir-book.htm#reactionSeverity) | The severity of an adverse reaction. |
| [http://hl7.org/fhir/referencerange-meaning (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-referencerange-meaning) | This value set defines a set of codes that can be used to indicate the meaning/use of a reference range |
| [http://hl7.org/fhir/resource-profile-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-profile-status) | The lifecycle status of a Resource Profile |
| [http://hl7.org/fhir/resource-slicing-rules](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-slicing-rules) | How slices are interpreted when evaluating an instance |
| [http://hl7.org/fhir/resource-types (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) | One of the resource types defined as part of FHIR |
| [http://hl7.org/fhir/response-code](http://hl7.org/implement/standards/fhir/fhir-book.htm#response-code) | The kind of response to a message |
| [http://hl7.org/fhir/restful-conformance-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-conformance-mode) | The mode of a restful conformance statement |
| [http://hl7.org/fhir/restful-operation](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-operation) | Operations supported by REST |
| [http://hl7.org/fhir/restful-security-service](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-security-service) | Types of security services used with FHIR |
| [http://hl7.org/fhir/search-param-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type) | Data types allowed to be used for search parameters |
| [http://hl7.org/fhir/security-event-action](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) | Indicator for type of action performed during the event that generated the audit. |
| [http://hl7.org/fhir/security-event-outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-outcome) | Indicates whether the event succeeded or failed |
| [http://hl7.org/fhir/security-event-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-type) | Event Types for Security Events - defined by DICOM with some FHIR specific additions |
| [http://hl7.org/fhir/security-source-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-source-type) | Security Alert Type Code |
| [http://hl7.org/fhir/sensitivitystatus](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitystatus) | The status of the adverse sensitivity |
| [http://hl7.org/fhir/sensitivitytype](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitytype) | The type of an adverse sensitivity |
| [http://hl7.org/fhir/special-values](http://hl7.org/implement/standards/fhir/fhir-book.htm#special-values) | A set of generally useful codes defined so they can be included in value sets |
| [http://hl7.org/fhir/supply-item-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-item) | This value sets refers to a specific supply item |
| [http://hl7.org/fhir/supply-status (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-status) | This value sets refers to a supply status |
| [http://hl7.org/fhir/supply-type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-type) | This value sets refers to a Category of supply |
| [http://hl7.org/fhir/valueset-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-status) | The lifecycle status of a Value Set |
| [http://hl7.org/fhir/vs/media-method (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-subtype) | Codes defined in Snomed-CT that can be used to record how images were recorded |
| [http://hl7.org/fhir/xds-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#xds-relationship-type) | The kind of relationship between two XDS documents |

# Codes defined in http://hl7.org/fhir/address-use

The use of an address

Formal value Set definition (identifier **http://hl7.org/fhir/vs/address-use**): [XML](http://hl7.org/implement/standards/fhir/address-use.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#address-use)) or [JSON](http://hl7.org/implement/standards/fhir/address-use.json).

This value set defines its own codesones defined internally:

## AddressUse

The use of an address

This value set defines its own terms in the system http://hl7.org/fhir/address-use

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| home |  | A communication address at a home |
| work |  | An office address. First choice for business related contacts during business hours |
| temp |  | A temporary address. The period can provide more detailed information |
| old |  | This address is no longer in use (or was never correct, but retained for records) |

These codes are used in the following places:

* [Address.use (§1.4.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Address)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.16 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.16) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/alert-status

Indicates whether this alert is active and needs to be displayed to a user, or whether it is no longer needed or entered in error

Formal value Set definition (identifier **http://hl7.org/fhir/vs/alert-status**): [XML](http://hl7.org/implement/standards/fhir/alert-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-status)) or [JSON](http://hl7.org/implement/standards/fhir/alert-status.json).

This value set defines its own codesones defined internally:

## AlertStatus

Indicates whether this alert is active and needs to be displayed to a user, or whether it is no longer needed or entered in error

This value set defines its own terms in the system http://hl7.org/fhir/alert-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| active |  | A current alert that should be displayed to a user. A system may use the category to determine which roles should view the alert |
| inactive |  | The alert does not need to be displayed any more |
| error |  | The alert was added in error, and should no longer be displayed |

These codes are used in the following places:

* [Alert.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.208 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.208) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/answer-format

The expected format of an answer

Formal value Set definition (identifier **http://hl7.org/fhir/vs/answer-format**): [XML](http://hl7.org/implement/standards/fhir/answer-format.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#answer-format)) or [JSON](http://hl7.org/implement/standards/fhir/answer-format.json).

This value set defines its own codesones defined internally:

## AnswerFormat

The expected format of an answer

This value set defines its own terms in the system http://hl7.org/fhir/answer-format

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| decimal |  | Answer is a floating point number |
| integer |  | Answer is an integer |
| boolean |  | Answer is a yes/no answer |
| date |  | Answer is a date |
| string |  | Answer is a free-text entry |
| dateTime |  | Answer is a date and time |
| instant |  | Answer is a system timestamp |
| single-choice |  | Answer is a single choice from the options |
| multiple-choice |  | Answer is one or more choices from the options |
| open-single-choice |  | Answer is a single choice from the options or a free-text entry |
| open-multiple-choice |  | Answer is one or more choices from the options and/or a free-text entry |

These codes are used in the following places:

* [Extension answerFormat (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire-extensions-spreadsheet.answerFormat)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.254 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.254) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/binding-conformance

Must applications comply with this binding?

Formal value Set definition (identifier **http://hl7.org/fhir/vs/binding-conformance**): [XML](http://hl7.org/implement/standards/fhir/binding-conformance.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#binding-conformance)) or [JSON](http://hl7.org/implement/standards/fhir/binding-conformance.json).

This value set defines its own codesones defined internally:

## BindingConformance

Must applications comply with this binding?

This value set defines its own terms in the system http://hl7.org/fhir/binding-conformance

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| required |  | Only codes in the specified set are allowed. If the binding is extensible, other codes may be used for concepts not covered by the bound set of codes |
| preferred |  | For greater interoperability, implementers are strongly encouraged to use the bound set of codes, however alternate codes may be used in derived profiles and implementations if necessary without being considered non-conformant |
| example |  | The codes in the set are an example to illustrate the meaning of the field. There is no particular preference for its use nor any assertion that the provided values are sufficient to meet implementation needs |

These codes are used in the following places:

* [Profile.binding.conformance](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.144 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.144) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/care-plan-activity-category

High-level categorization of the type of activity in a care plan.

Formal value Set definition (identifier **http://hl7.org/fhir/vs/care-plan-activity-category**): [XML](http://hl7.org/implement/standards/fhir/care-plan-activity-category.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-category)) or [JSON](http://hl7.org/implement/standards/fhir/care-plan-activity-category.json).

This value set defines its own codesones defined internally:

## CarePlanActivityCategory

High-level categorization of the type of activity in a care plan.

This value set defines its own terms in the system http://hl7.org/fhir/care-plan-activity-category

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| diet |  | Plan for the patient to consume food of a specified nature |
| drug |  | Plan for the patient to consume/receive a drug, vaccine or other product |
| encounter |  | Plan to meet or communicate with the patient (in-patient, out-patient, phone call, etc.) |
| observation |  | Plan to capture information about a patient (vitals, labs, diagnostic images, etc.) |
| procedure |  | Plan to modify the patient in some way (surgery, physiotherapy, education, counselling, etc.) |
| supply |  | Plan to provide something to the patient (medication, medical supply, etc.) |
| other |  | Some other form of action |

These codes are used in the following places:

* [CarePlan.activity.category](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.39 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.39) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/care-plan-activity-status

Indicates where the activity is at in its overall life cycle

Formal value Set definition (identifier **http://hl7.org/fhir/vs/care-plan-activity-status**): [XML](http://hl7.org/implement/standards/fhir/care-plan-activity-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-status)) or [JSON](http://hl7.org/implement/standards/fhir/care-plan-activity-status.json).

This value set defines its own codesones defined internally:

## CarePlanActivityStatus

Indicates where the activity is at in its overall life cycle

This value set defines its own terms in the system http://hl7.org/fhir/care-plan-activity-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| not started |  | Activity is planned but no action has yet been taken |
| scheduled |  | Appointment or other booking has occurred but activity has not yet begun |
| ongoing |  | Activity has been started but is not yet complete |
| on hold |  | Activity was started but has temporarily ceased with an expectation of resumption at a future time. |
| completed |  | The activities have been completed (more or less) as planned |
| discontinued |  | The activities have been ended prior to completion (perhaps even before they were started) |

These codes are used in the following places:

* [CarePlan.activity.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.41 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.41) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/care-plan-goal-status

Indicates whether the goal has been met and is still being targeted

Formal value Set definition (identifier **http://hl7.org/fhir/vs/care-plan-goal-status**): [XML](http://hl7.org/implement/standards/fhir/care-plan-goal-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-goal-status)) or [JSON](http://hl7.org/implement/standards/fhir/care-plan-goal-status.json).

This value set defines its own codesones defined internally:

## CarePlanGoalStatus

Indicates whether the goal has been met and is still being targeted

This value set defines its own terms in the system http://hl7.org/fhir/care-plan-goal-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| in progress |  | The goal is being sought but has not yet been reached. (Also applies if goal was reached in the past but there has been regression and goal is being sought again) |
| achieved |  | The goal has been met and no further action is needed |
| sustaining |  | The goal has been met, but ongoing activity is needed to sustain the goal objective |
| abandoned |  | The goal is no longer being sought |

These codes are used in the following places:

* [CarePlan.goal.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.38 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.38) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/care-plan-status

Indicates whether the plan is currently being acted upon, represents future intentions or is now just historical record.

Formal value Set definition (identifier **http://hl7.org/fhir/vs/care-plan-status**): [XML](http://hl7.org/implement/standards/fhir/care-plan-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-status)) or [JSON](http://hl7.org/implement/standards/fhir/care-plan-status.json).

This value set defines its own codesones defined internally:

## CarePlanStatus

Indicates whether the plan is currently being acted upon, represents future intentions or is now just historical record.

This value set defines its own terms in the system http://hl7.org/fhir/care-plan-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| planned |  | The plan is in development or awaiting use but is not yet intended to be acted upon. |
| active |  | The plan is intended to be followed and used as part of patient care |
| ended |  | The plan is no longer in use and is not expected to be followed or used in patient care |

These codes are used in the following places:

* [CarePlan.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.36 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.36) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/causalityExpectation

How likely is it that the given exposure caused a reaction

Formal value Set definition (identifier **http://hl7.org/fhir/vs/causalityExpectation**): [XML](http://hl7.org/implement/standards/fhir/causalityExpectation.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#causalityExpectation)) or [JSON](http://hl7.org/implement/standards/fhir/causalityExpectation.json).

This value set defines its own codesones defined internally:

## CausalityExpectation

How likely is it that the given exposure caused a reaction

This value set defines its own terms in the system http://hl7.org/fhir/causalityExpectation

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| likely |  | Likely that this specific exposure caused the reaction |
| unlikely |  | Unlikely that this specific exposure caused the reaction - the exposure is being linked to for information purposes |
| confirmed |  | It has been confirmed that this exposure was one of the causes of the reaction |
| unknown |  | It is unknown whether this exposure had anything to do with the reaction |

These codes are used in the following places:

* [AdverseReaction.exposure.causalityExpectation](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.32 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.32) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/code-selection-mode

The way in which the code is selected

Formal value Set definition (identifier **http://hl7.org/fhir/vs/code-selection-mode**): [XML](http://hl7.org/implement/standards/fhir/code-selection-mode.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#code-selection-mode)) or [JSON](http://hl7.org/implement/standards/fhir/code-selection-mode.json).

This value set defines its own codesones defined internally:

## CodeSelectionMode

The way in which the code is selected

This value set defines its own terms in the system http://hl7.org/fhir/code-selection-mode

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| code |  | Only this code is selected |
| children |  | Only the immediate children (codes with a is\_a relationship) are selected, but not this code itself |
| descendants |  | All descendants of this code are selected, but not this code itself |
| all |  | This code and any descendants are selected |
| system |  | All codes from the specified code system |

These codes are not currently used

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.176 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.176) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/condition-relationship-type

The type of relationship between a condition and its related item

Formal value Set definition (identifier **http://hl7.org/fhir/vs/condition-relationship-type**): [XML](http://hl7.org/implement/standards/fhir/condition-relationship-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-relationship-type)) or [JSON](http://hl7.org/implement/standards/fhir/condition-relationship-type.json).

This value set defines its own codesones defined internally:

## ConditionRelationshipType

The type of relationship between a condition and its related item

This value set defines its own terms in the system http://hl7.org/fhir/condition-relationship-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| due-to |  | this condition is a consequence of the identified condition/procedure/substance |
| following |  | this condition follows the identified condition/procedure/substance, but it is not known whether they are causally linked |

These codes are used in the following places:

* [Condition.relatedItem.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.228 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.228) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/condition-status

The clinical status of the Condition or diagnosis

Formal value Set definition (identifier **http://hl7.org/fhir/vs/condition-status**): [XML](http://hl7.org/implement/standards/fhir/condition-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-status)) or [JSON](http://hl7.org/implement/standards/fhir/condition-status.json).

This value set defines its own codesones defined internally:

## ConditionStatus

The clinical status of the Condition or diagnosis

This value set defines its own terms in the system http://hl7.org/fhir/condition-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| provisional |  | This is a tentative diagnosis - still a candidate that is under consideration |
| working |  | The patient is being treated on the basis that this is the condition, but it is still not confirmed |
| confirmed |  | There is sufficient diagnostic and/or clinical evidence to treat this as a confirmed condition |
| refuted |  | This condition has been ruled out by diagnostic and clinical evidence |

These codes are used in the following places:

* [Condition.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.225 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.225) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/conformance-statement-status

The status of this conformance statement

Formal value Set definition (identifier **http://hl7.org/fhir/vs/conformance-statement-status**): [XML](http://hl7.org/implement/standards/fhir/conformance-statement-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-statement-status)) or [JSON](http://hl7.org/implement/standards/fhir/conformance-statement-status.json).

This value set defines its own codesones defined internally:

## ConformanceStatementStatus

The status of this conformance statement

This value set defines its own terms in the system http://hl7.org/fhir/conformance-statement-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| draft |  | This conformance statement is still under development |
| active |  | This conformance statement is ready for use in production systems |
| retired |  | This conformance statement has been withdrawn or superseded and should no longer be used |

These codes are used in the following places:

* [Conformance.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.255 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.255) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/constraint-severity

Must applications comply with this constraint?

Formal value Set definition (identifier **http://hl7.org/fhir/vs/constraint-severity**): [XML](http://hl7.org/implement/standards/fhir/constraint-severity.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#constraint-severity)) or [JSON](http://hl7.org/implement/standards/fhir/constraint-severity.json).

This value set defines its own codesones defined internally:

## ConstraintSeverity

Must applications comply with this constraint?

This value set defines its own terms in the system http://hl7.org/fhir/constraint-severity

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| error |  | If the constraint is violated, the resource is not conformant |
| warning |  | If the constraint is violated, the resource is conformant, but it is not necessarily following best practice. |

These codes are used in the following places:

* [Profile.structure.element.definition.constraint.severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.146 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.146) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/contact-system

What kind of contact this is

Formal value Set definition (identifier **http://hl7.org/fhir/vs/contact-system**): [XML](http://hl7.org/implement/standards/fhir/contact-system.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-system)) or [JSON](http://hl7.org/implement/standards/fhir/contact-system.json).

This value set defines its own codesones defined internally:

## ContactSystem

What kind of contact this is

This value set defines its own terms in the system http://hl7.org/fhir/contact-system

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| phone |  | The value is a telephone number used for voice calls. Use of full international numbers starting with + is recommended to enable automatic dialling support but not required. |
| fax |  | The value is a fax machine. Use of full international numbers starting with + is recommended to enable automatic dialling support but not required. |
| email |  | The value is an email address |
| url |  | The value is a url. This is intended for various personal contacts including blogs, Twitter, Facebook, etc. Do not use for email addresses |

These codes are used in the following places:

* [Contact.system (§1.4.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.17 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.17) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/contact-use

How to use this address

Formal value Set definition (identifier **http://hl7.org/fhir/vs/contact-use**): [XML](http://hl7.org/implement/standards/fhir/contact-use.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-use)) or [JSON](http://hl7.org/implement/standards/fhir/contact-use.json).

This value set defines its own codesones defined internally:

## ContactUse

How to use this address

This value set defines its own terms in the system http://hl7.org/fhir/contact-use

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| home |  | A communication contact at a home; attempted contacts for business purposes might intrude privacy and chances are one will contact family or other household members instead of the person one wishes to call. Typically used with urgent cases, or if no other contacts are available. |
| work |  | An office contact. First choice for business related contacts during business hours. |
| temp |  | A temporary contact. The period can provide more detailed information. |
| old |  | This contact is no longer in use (or was never correct, but retained for records) |
| mobile |  | A telecommunication device that moves and stays with its owner. May have characteristics of all other use codes, suitable for urgent matters, not the first choice for routine business |

These codes are used in the following places:

* [Contact.use (§1.4.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Contact)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.18 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.18) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/criticality

The criticality of an adverse sensitivity

Formal value Set definition (identifier **http://hl7.org/fhir/vs/criticality**): [XML](http://hl7.org/implement/standards/fhir/criticality.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#criticality)) or [JSON](http://hl7.org/implement/standards/fhir/criticality.json).

This value set defines its own codesones defined internally:

## Criticality

The criticality of an adverse sensitivity

This value set defines its own terms in the system http://hl7.org/fhir/criticality

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| fatal |  | Likely to result in death if re-exposed |
| high |  | Likely to result in reactions that will need to be treated if re-exposed |
| medium |  | Likely to result in reactions that will inconvenience the subject |
| low |  | Not likely to result in any inconveniences for the subject |

These codes are used in the following places:

* [AllergyIntolerance.criticality](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.33 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.33) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
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| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/data-absent-reason

Used to specify why the normally expected content of the data element is missing

Formal value Set definition (identifier **http://hl7.org/fhir/vs/data-absent-reason**): [XML](http://hl7.org/implement/standards/fhir/data-absent-reason.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#data-absent-reason)) or [JSON](http://hl7.org/implement/standards/fhir/data-absent-reason.json).

This value set defines its own codesones defined internally:

## DataAbsentReason

Used to specify why the normally expected content of the data element is missing

This value set defines its own terms in the system http://hl7.org/fhir/data-absent-reason

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| unknown |  | The value is not known |
| asked |  | The source human does not know the value |
| temp |  | There is reason to expect (from the workflow) that the value may become known |
| notasked |  | The workflow didn't lead to this value being known |
| masked |  | The information is not available due to security, privacy or related reasons |
| unsupported |  | The source system wasn't capable of supporting this element |
| astext |  | The content of the data is represented as text |
| error |  | Some system or workflow process error means that the information is not available |

These codes are not currently used

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.2 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.2) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/device-data-type

The type of data produced by a device

Formal value Set definition (identifier **http://hl7.org/fhir/vs/device-data-type**): [XML](http://hl7.org/implement/standards/fhir/device-data-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-data-type)) or [JSON](http://hl7.org/implement/standards/fhir/device-data-type.json).

This value set defines its own codesones defined internally:

## DeviceDataType

The type of data produced by a device

This value set defines its own terms in the system http://hl7.org/fhir/device-data-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| Quantity |  | The data item is a quantity. The string value should be merged with the units, and the ucum value if provided, to create a valid quantity |
| Range |  | The data item is a range. The string value should be split about the " - " into low and high, with the units and ucum (if provided) filling out the low and high quantities |
| Coding |  | The data item is a code (i.e. true/false etc.). The value should be built into a valid coding by filling out the system element provided |
| Array |  | The data item is an Array (a sequence of sample measures, which must be merged with the Array template) |
| string |  | The data item is a simple string |

These codes are used in the following places:

* [DeviceCapabilities.virtualDevice.channel.metric.info.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.54 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.54) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/device-value-flag

Flags that supply information about the status of a device reading

Formal value Set definition (identifier **http://hl7.org/fhir/vs/device-value-flag**): [XML](http://hl7.org/implement/standards/fhir/device-value-flag.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-value-flag)) or [JSON](http://hl7.org/implement/standards/fhir/device-value-flag.json).

This value set defines its own codesones defined internally:

## DeviceValueFlag

Flags that supply information about the status of a device reading

This value set defines its own terms in the system http://hl7.org/fhir/device-value-flag

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| ok |  | the value is valid |
| ongoing |  | An early estimate of value; measurement is still occurring |
| early |  | An early estimate of value; processing is still occurring |
| questionable |  | The observation value should be treated with care (there are reasons for doubting the accuracy of the current value) |
| calibrating |  | The value has been generated while calibration is occurring |
| error |  | the current conditions are invalid, and the value should not be used |
| unknown |  | No observation value was available |
| test |  | this is test data |
| demo |  | this is demo data |
| under |  | the value is under accurate measurement limits |
| over |  | the value is over accurate measurement limits |
| alarm |  | the value is associated with an active alarm condition |
| alarm-off |  | the value would be associated with an active alarm, but alarms are turned off |

These codes are used in the following places:

* [DeviceLog.item.flag](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.56 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.56) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
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| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/diagnostic-order-status

The status of a diagnostic order

Formal value Set definition (identifier **http://hl7.org/fhir/vs/diagnostic-order-status**): [XML](http://hl7.org/implement/standards/fhir/diagnostic-order-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status)) or [JSON](http://hl7.org/implement/standards/fhir/diagnostic-order-status.json).

This value set defines its own codesones defined internally:

## DiagnosticOrderStatus

The status of a diagnostic order

This value set defines its own terms in the system http://hl7.org/fhir/diagnostic-order-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| requested |  | The request has been placed |
| received |  | The receiving system has received the order, but not yet decided whether it will be performed |
| accepted |  | The receiving system has accepted the order, but work has not yet commenced |
| inprogress |  | The work to fulfill the order is happening |
| review |  | The work is complete, and the outcomes are being reviewed for approval |
| complete |  | The work has been complete, the report(s) released, and no further work is planned |
| suspended |  | The request has been held by originating system/user request |
| rejected |  | The receiving system has declined to fulfill the request |
| failed |  | The diagnostic investigation was attempted, but due to some procedural error, it could not be completed |

These codes are used in the following places:

* [DiagnosticOrder.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder.def)
* [DiagnosticOrder.event.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder.def)
* [DiagnosticOrder.item.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.207 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.207) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/document-attestation-mode

The way in which a person authenticated a document

Formal value Set definition (identifier **http://hl7.org/fhir/vs/document-attestation-mode**): [XML](http://hl7.org/implement/standards/fhir/document-attestation-mode.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-attestation-mode)) or [JSON](http://hl7.org/implement/standards/fhir/document-attestation-mode.json).

This value set defines its own codesones defined internally:

## DocumentAttestationMode

The way in which a person authenticated a document

This value set defines its own terms in the system http://hl7.org/fhir/document-attestation-mode

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| personal |  | The person authenticated the document in their personal capacity |
| professional |  | The person authenticated the document in their professional capacity |
| legal |  | The person authenticated the document and accepted legal responsibility for its content |
| official |  | The organization authenticated the document as consistent with their policies and procedures |

These codes are used in the following places:

* [Document.attester.mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.64 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.64) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/document-mode

Whether the application produces or consumes documents

Formal value Set definition (identifier **http://hl7.org/fhir/vs/document-mode**): [XML](http://hl7.org/implement/standards/fhir/document-mode.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-mode)) or [JSON](http://hl7.org/implement/standards/fhir/document-mode.json).

This value set defines its own codesones defined internally:

## DocumentMode

Whether the application produces or consumes documents

This value set defines its own terms in the system http://hl7.org/fhir/document-mode

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| producer |  | The application produces documents of the specified type |
| consumer |  | The application consumes documents of the specified type |

These codes are used in the following places:

* [Conformance.document.mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.47 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.47) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/document-reference-status

The status of the document reference

Formal value Set definition (identifier **http://hl7.org/fhir/vs/document-reference-status**): [XML](http://hl7.org/implement/standards/fhir/document-reference-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-reference-status)) or [JSON](http://hl7.org/implement/standards/fhir/document-reference-status.json).

This value set defines its own codesones defined internally:

## DocumentReferenceStatus

The status of the document reference

This value set defines its own terms in the system http://hl7.org/fhir/document-reference-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| current |  | This is the current reference for this document |
| superseded |  | This reference has been superseded by another reference |
| error |  | This reference was created in error |

These codes are used in the following places:

* [DocumentReference.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.67 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.67) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/document-status

The workflow/clinical status of this document

Formal value Set definition (identifier **http://hl7.org/fhir/vs/document-status**): [XML](http://hl7.org/implement/standards/fhir/document-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-status)) or [JSON](http://hl7.org/implement/standards/fhir/document-status.json).

This value set defines its own codesones defined internally:

## DocumentStatus

The workflow/clinical status of this document

This value set defines its own terms in the system http://hl7.org/fhir/document-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| interim |  | This is an initial or interim document. The content may be incomplete or unverified |
| final |  | The document is complete and verified by an appropriate person |
| amended |  | The document has been modified subsequent to being released as "final", and is complete and verified by an authorised person |
| withdrawn |  | The document has been withdrawn following prior release |

These codes are used in the following places:

* [Document.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.244 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.244) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/encounter-class

Classification of the encounter

Formal value Set definition (identifier **http://hl7.org/fhir/vs/encounter-class**): [XML](http://hl7.org/implement/standards/fhir/encounter-class.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-class)) or [JSON](http://hl7.org/implement/standards/fhir/encounter-class.json).

This value set defines its own codesones defined internally:

## EncounterClass

Classification of the encounter

This value set defines its own terms in the system http://hl7.org/fhir/encounter-class

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| inpatient |  | A patient that stays overnight |
| outpatient |  |  |
| ambulatory |  |  |
| emergency |  |  |
| home |  |  |
| field |  |  |
| acute |  |  |
| non-acute |  |  |
| daytime |  |  |
| virtual |  |  |

These codes are used in the following places:

* [Encounter.class](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.182 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.182) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/encounter-state

Current state of the encounter

Formal value Set definition (identifier **http://hl7.org/fhir/vs/encounter-state**): [XML](http://hl7.org/implement/standards/fhir/encounter-state.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-state)) or [JSON](http://hl7.org/implement/standards/fhir/encounter-state.json).

This value set defines its own codesones defined internally:

## EncounterState

Current state of the encounter

This value set defines its own terms in the system http://hl7.org/fhir/encounter-state

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| planned |  |  |
| current |  |  |
| onleave |  |  |
| finished |  |  |
| cancelled |  |  |

These codes are used in the following places:

* [Encounter.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.180 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.180) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/event-timing

A real world event that a schedule is related to

Formal value Set definition (identifier **http://hl7.org/fhir/vs/event-timing**): [XML](http://hl7.org/implement/standards/fhir/event-timing.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#event-timing)) or [JSON](http://hl7.org/implement/standards/fhir/event-timing.json).

This is a value set with codes taken from <http://hl7.org/fhir/v3//timingevent>:

## EventTiming

A real world event that a schedule is related to

This value set includes codes defined in other code systems, using the following rules:

* Include these codes as defined in http://hl7.org/fhir/v3//timingevent

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| HS |  |  |
| WAKE |  |  |
| AC |  |  |
| ACM |  |  |
| ACD |  |  |
| ACV |  |  |
| PC |  |  |
| PCM |  |  |
| PCD |  |  |
| PCV |  |  |

These codes are used in the following places:

* [Schedule.repeat.when (§1.4.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.19 (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/exposureType

The type of exposure that resulted in an adverse reaction

Formal value Set definition (identifier **http://hl7.org/fhir/vs/exposureType**): [XML](http://hl7.org/implement/standards/fhir/exposureType.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#exposureType)) or [JSON](http://hl7.org/implement/standards/fhir/exposureType.json).

This value set defines its own codesones defined internally:

## ExposureType

The type of exposure that resulted in an adverse reaction

This value set defines its own terms in the system http://hl7.org/fhir/exposureType

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| drugadmin |  | Drug Administration |
| immuniz |  | Immunization |
| coincidental |  | In the same area as the substance |

These codes are used in the following places:

* [AdverseReaction.exposure.exposureType](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.31 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.31) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/extension-context

How an extension context is interpreted

Formal value Set definition (identifier **http://hl7.org/fhir/vs/extension-context**): [XML](http://hl7.org/implement/standards/fhir/extension-context.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#extension-context)) or [JSON](http://hl7.org/implement/standards/fhir/extension-context.json).

This value set defines its own codesones defined internally:

## ExtensionContext

How an extension context is interpreted

This value set defines its own terms in the system http://hl7.org/fhir/extension-context

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| resource |  | The context is all elements matching a particular resource element path |
| datatype |  | The context is all nodes matching a particular data type element path (root or repeating element) or all elements referencing a particular primitive data type (expressed as the datatype name) |
| mapping |  | The context is all nodes whose mapping to a specified reference model corresponds to a particular mapping structure. The context identifies the mapping target. The mapping should clearly identify where such an extension could be used, though this |
| extension |  | The context is a particular extension from a particular profile. Expressed as uri#name, where uri identifies the profile and #name identifies the extension code |

These codes are used in the following places:

* [Profile.extensionDefn.contextType](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.145 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.145) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/familial-relationship

The nature of the relationship between the patient and the person with the condition. Based on the HL7v3 RoleCode: OID: 2.16.840.1.113883.5.111 with some inappropriate items removed

Formal value Set definition (identifier **http://hl7.org/fhir/vs/familial-relationship**): [XML](http://hl7.org/implement/standards/fhir/familial-relationship.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#familial-relationship)) or [JSON](http://hl7.org/implement/standards/fhir/familial-relationship.json).

This is a value set with codes taken from <http://hl7.org/fhir/v3//familyrelationship>:

## FamilialRelationship

The nature of the relationship between the patient and the person with the condition. Based on the HL7v3 RoleCode: OID: 2.16.840.1.113883.5.111 with some inappropriate items removed

This value set includes codes defined in other code systems, using the following rules:

* Include these codes as defined in http://hl7.org/fhir/v3//familyrelationship

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| AUNT |  |  |
| BRO |  |  |
| BROINLAW |  |  |
| CHLDADOPT |  |  |
| CHLDFOST |  |  |
| CHLDINLAW |  |  |
| COUSN |  |  |
| DAU |  |  |
| DAUADOPT |  |  |
| DAUC |  |  |
| DAUFOST |  |  |
| DAUINLAW |  |  |
| CHILD |  |  |
| EXT |  |  |
| IMED |  |  |
| PRN |  |  |
| SIB |  |  |
| SIGOTHR |  |  |
| DOMPART |  |  |
| SPS |  |  |
| FTH |  |  |
| FTHINLAW |  |  |
| GGRFTH |  |  |
| GGRMTH |  |  |
| GGRPRN |  |  |
| GRFTH |  |  |
| GRMTH |  |  |
| GRNDCHILD |  |  |
| GRNDDAU |  |  |
| GRNDSON |  |  |
| GRPRN |  |  |
| HBRO |  |  |
| HSIB |  |  |
| HSIS |  |  |
| HUSB |  |  |
| MTH |  |  |
| MTHINLAW |  |  |
| NBOR |  |  |
| NBRO |  |  |
| NCHILD |  |  |
| NEPHEW |  |  |
| NFTH |  |  |
| NFTHF |  |  |
| NIECE |  |  |
| NIENEPH |  |  |
| NMTH |  |  |
| NOK |  |  |
| NPRN |  |  |
| NSIB |  |  |
| NSIS |  |  |
| PRNINLAW |  |  |
| ROOM |  |  |
| SIBINLAW |  |  |
| SIS |  |  |
| SISINLAW |  |  |
| SON |  |  |
| SONADOPT |  |  |
| SONC |  |  |
| SONFOST |  |  |
| SONINLAW |  |  |
| STPBRO |  |  |
| STPCHLD |  |  |
| STPDAU |  |  |
| STPFTH |  |  |
| STPMTH |  |  |
| STPPRN |  |  |
| STPSIB |  |  |
| STPSIS |  |  |
| STPSON |  |  |
| UNCLE |  |  |
| WIFE |  |  |

These codes are used in the following places:

* [FamilyHistory.relation.relationship](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.69 (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/filter-operator

The kind of operation to perform as part of a property based filter

Formal value Set definition (identifier **http://hl7.org/fhir/vs/filter-operator**): [XML](http://hl7.org/implement/standards/fhir/filter-operator.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#filter-operator)) or [JSON](http://hl7.org/implement/standards/fhir/filter-operator.json).

This value set defines its own codesones defined internally:

## FilterOperator

The kind of operation to perform as part of a property based filter

This value set defines its own terms in the system http://hl7.org/fhir/filter-operator

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| = |  | The property value has the concept specified by the value |
| is\_a |  | The property value has a concept that has an is\_a relationship with the value |
| is\_not\_a |  | The property value has a concept that does not have an is\_a relationship with the value |
| regex |  | The property value representation matches the regex specified in the value |

These codes are used in the following places:

* [ValueSet.compose.include.filter.op](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.177 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.177) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/group-type

Types of resources that are part of group

Formal value Set definition (identifier **http://hl7.org/fhir/vs/group-type**): [XML](http://hl7.org/implement/standards/fhir/group-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-type)) or [JSON](http://hl7.org/implement/standards/fhir/group-type.json).

This value set defines its own codesones defined internally:

## GroupType

Types of resources that are part of group

This value set defines its own terms in the system http://hl7.org/fhir/group-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| person |  | Group contains "person" Patient resources |
| animal |  | Group contains "animal" Patient resources |
| device |  | Group contains Device resources |
| medication |  | Group contains Medication resources |
| substance |  | Group contains Substance resources |

These codes are used in the following places:

* [Group.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#group.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.74 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.74) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/hierarchical-relationship-type

Type indicating if this is a parent or child relationship

Formal value Set definition (identifier **http://hl7.org/fhir/vs/hierarchical-relationship-type**): [XML](http://hl7.org/implement/standards/fhir/hierarchical-relationship-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#hierarchical-relationship-type)) or [JSON](http://hl7.org/implement/standards/fhir/hierarchical-relationship-type.json).

This value set defines its own codesones defined internally:

## HierarchicalRelationshipType

Type indicating if this is a parent or child relationship

This value set defines its own terms in the system http://hl7.org/fhir/hierarchical-relationship-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| parent | Parent | The target resource is the parent of the focal specimen resource |
| child | Child | The target resource is the child of the focal specimen resource |

These codes are used in the following places:

* [Specimen.source.relationship](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.233 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.233) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/identifier-use

Identifies the use for this identifier, if known

Formal value Set definition (identifier **http://hl7.org/fhir/vs/identifier-use**): [XML](http://hl7.org/implement/standards/fhir/identifier-use.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#identifier-use)) or [JSON](http://hl7.org/implement/standards/fhir/identifier-use.json).

This value set defines its own codesones defined internally:

## IdentifierUse

Identifies the use for this identifier, if known

This value set defines its own terms in the system http://hl7.org/fhir/identifier-use

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| usual |  | the identifier recommended for display and use in real-world interactions |
| official |  | the identifier considered to be most trusted for the identification of this item |
| temp |  | A temporary identifier |

These codes are used in the following places:

* [Identifier.use (§1.4.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Identifier)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.13 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.13) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/imaging-modality

Type of acquired image data in the instance

Formal value Set definition (identifier **http://hl7.org/fhir/vs/imaging-modality**): [XML](http://hl7.org/implement/standards/fhir/imaging-modality.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#imaging-modality)) or [JSON](http://hl7.org/implement/standards/fhir/imaging-modality.json).

This is a value set with codes taken from [http://nema.org/dicom/dcid (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim):

## ImagingModality

Type of acquired image data in the instance

This value set includes codes defined in other code systems, using the following rules:

* Include these codes as defined in [http://nema.org/dicom/dcid (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim)

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Display** | **Definition** | **Comments** |
| AR | Autorefraction | Autorefraction device |  |
| BMD | Bone Mineral Densitometry | Bone Mineral Densitometry by X-Ray (modality), including dual-energy X-Ray absorptiometry (DXA) and morphometric X-Ray absorptiometry (MXA) |  |
| BDUS | Ultrasound Bone Densitometry | Ultrasound Bone Densitometry (modality) |  |
| EPS | Cardiac Electrophysiology | Cardiac Electrophysiology device |  |
| CR | Computed Radiography | Computed Radiography device |  |
| CT | Computed Tomography | Computed Tomography device |  |
| DX | Digital Radiography | Digital Radiography device |  |
| ECG | Electrocardiography | Electrocardiography device |  |
| ES | Endoscopy | Endoscopy device |  |
| XC | External-camera Photography | External-camera Photography device | Note: Use this for general photography |
| GM | General Microscopy | General Microscopy device |  |
| HD | Hemodynamic Waveform | Hemodynamic Waveform acquisition device |  |
| IO | Intra-oral Radiography | Intra-oral Radiography device |  |
| IVOCT |  |  |  |
| IVUS | Intravascular Ultrasound | Intravascular Ultrasound device |  |
| KER | Keratometry | Keratometry device |  |
| LEN | Lensometry | Lensometry device |  |
| MR | Magnetic Resonance | Magnetic Resonance device |  |
| MG | Mammography | Mammography device |  |
| NM | Nuclear Medicine | Nuclear Medicine device |  |
| OAM | Ophthalmic Axial Measurements | Measurements of the axial length of the eye which are done by various devices |  |
| OCT | Optical Coherence Tomography | Modality device that uses an interferometric, non-invasive optical tomographic technique to image 2D slices and 3D volumes of tissue using visible and near visible frequencies. |  |
| OPM | Ophthalmic Mapping | Modality device that measures corneal topography, corneal or retinal thickness, and other similar parameters that are typically displayed as maps. |  |
| OP | Ophthalmic photography | Ophthalmic photography modality |  |
| OPR | Ophthalmic Refraction | Modality device that measures the refractive characteristics of the eye. |  |
| OPT | Ophthalmic Tomography | Tomography of the eye acquired by a modality that is based on light and optical principles. Tomography based on other principles, such as ultrasound, is excluded. |  |
| OPV | Ophthalmic Visual Field | Modality device that measures visual fields and perform visual perimetry. |  |
| PX | Panoramic X-Ray | Panoramic X-Ray device |  |
| PT | Positron emission tomography | Positron emission tomography (PET) device |  |
| RF | Radiofluoroscopy | Radiofluoroscopy device |  |
| RG | Radiographic imaging | Radiographic imaging (conventional film/screen) |  |
| SM | Slide Microscopy | Slide Microscopy |  |
| SRF | Subjective Refraction | Subjective Refraction device |  |
| US | Ultrasound | Ultrasound device |  |
| VA | Visual Acuity | Visual Acuity device |  |
| XA | X-Ray Angiography | X-Ray Angiography device |  |

These codes are used in the following places:

* [ImagingStudy.modalities](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy.def)
* Imported into Valueset [XDS Connect-a-thon eventCodes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-event-code)
* Imported into Valueset [Media Method Codes (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-subtype)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.234 1.2.840.10008.6.1.19 (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/immunization-forecast-status

The patient's status with respect to a vaccintion protocol

Formal value Set definition (identifier **http://hl7.org/fhir/vs/immunization-forecast-status**): [XML](http://hl7.org/implement/standards/fhir/immunization-forecast-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-forecast-status)) or [JSON](http://hl7.org/implement/standards/fhir/immunization-forecast-status.json).

This value set defines its own codesones defined internally:

## ImmunizationForecastStatus

The patient's status with respect to a vaccintion protocol

This value set defines its own terms in the system http://hl7.org/fhir/immunization-forecast-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| DUE |  |  |

These codes are used in the following places:

* [ImmunizationProfile.recommendation.forecastStatus](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.84 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.84) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/instance-availability

Availability of the resource

Formal value Set definition (identifier **http://hl7.org/fhir/vs/instance-availability**): [XML](http://hl7.org/implement/standards/fhir/instance-availability.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#instance-availability)) or [JSON](http://hl7.org/implement/standards/fhir/instance-availability.json).

This is a value set with codes taken from [http://nema.org/dicom/dcid (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim):

## InstanceAvailability

Availability of the resource

This value set includes codes defined in other code systems, using the following rules:

* Include these codes as defined in [http://nema.org/dicom/dcid (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim)

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| ONLINE | Online | Instances are immediately available |
| OFFLINE | Offline | Instances need to be retrieved by manual intervention |
| NEARLINE | Nearline | Instances need to be retrieved from relatively slow media such as optical disk or tape |
| UNAVAILABLE | Unavailable | Instances cannot be retrieved. |

These codes are used in the following places:

* [ImagingStudy.availability](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy.def)
* [ImagingStudy.series.availability](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.76 (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/issue-severity

How the issue affects the success of the action

Formal value Set definition (identifier **http://hl7.org/fhir/vs/issue-severity**): [XML](http://hl7.org/implement/standards/fhir/issue-severity.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-severity)) or [JSON](http://hl7.org/implement/standards/fhir/issue-severity.json).

This value set defines its own codesones defined internally:

## IssueSeverity

How the issue affects the success of the action

This value set defines its own terms in the system http://hl7.org/fhir/issue-severity

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| fatal |  | The issue caused the action to fail, and no further checking could be performed |
| error |  | The issue is sufficiently important to cause the action to fail |
| warning |  | The issue is not important enough to cause the action to fail, but may cause it to be performed suboptimally or in a way that is not as desired |
| information |  | The issue has no relation to the degree of success of the action |

These codes are used in the following places:

* [OperationOutcome.issue.severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.120 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.120) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/issue-type

A coded expression of the type of issue

Formal value Set definition (identifier **http://hl7.org/fhir/vs/issue-type**): [XML](http://hl7.org/implement/standards/fhir/issue-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-type)) or [JSON](http://hl7.org/implement/standards/fhir/issue-type.json).

This value set defines its own codesones defined internally:

## IssueType

A coded expression of the type of issue

This value set defines its own terms in the system http://hl7.org/fhir/issue-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| invalid |  | Content invalid against Specification or Profile |
| ..structure |  | content structural issue |
| ..required |  | required element missing |
| ..value |  | element value invalid |
| ..invariant |  | schematron rule |
| security |  | authorization/permissions issue |
| ..login |  | the client needs to initiate the authentication process () |
| ..unknown |  | user/system not able to be authenticated |
| ..expired |  | user session expired |
| ..forbidden |  | user rights failure |
| processing |  | processing issues |
| ..not-supported |  | resource not supported |
| ..duplicate |  | duplicate resource |
| ..not-found |  | reference not found |
| ..too-long |  | existing content too long |
| ..code-unknown |  | code could not be understood |
| ..extension |  | extension not recognised |
| ..too-costly |  | operation denied to protect server resources |
| ..business-rule |  | content failed to pass some business rule |
| ..conflict |  | content could not be accepted because of an edit conflict (i.e. version aware updates) |
| transient |  | transient processing issues |
| ..lock-error |  | resource/record locking failure |
| ..no-store |  | persistent store unavailable |
| ..exception |  | unexpected internal error |
| ..timeout |  | internal timeout |
| ..throttled |  | The system is not prepared to handle this request due to load management |

These codes are used in the following places:

* [OperationOutcome.issue.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.121 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.121) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/list-mode

The processing mode that applies to this list

Formal value Set definition (identifier **http://hl7.org/fhir/vs/list-mode**): [XML](http://hl7.org/implement/standards/fhir/list-mode.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-mode)) or [JSON](http://hl7.org/implement/standards/fhir/list-mode.json).

This value set defines its own codesones defined internally:

## ListMode

The processing mode that applies to this list

This value set defines its own terms in the system http://hl7.org/fhir/list-mode

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| working |  | This list is the master list, maintained in an ongoing fashion with regular updates as the real world list it is tracking changes |
| snapshot |  | This list was prepared as a snapshot. It should not be assumed to be current |
| changes |  | The list is prepared as a statement of changes that have been made or recommended |

These codes are used in the following places:

* [List.mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#list.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.88 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.88) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/media-type

Whether the Media is a photo, video, or audio

Formal value Set definition (identifier **http://hl7.org/fhir/vs/media-type**): [XML](http://hl7.org/implement/standards/fhir/media-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-type)) or [JSON](http://hl7.org/implement/standards/fhir/media-type.json).

This value set defines its own codesones defined internally:

## MediaType

Whether the Media is a photo, video, or audio

This value set defines its own terms in the system http://hl7.org/fhir/media-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| photo |  | The media consists of one or more unmoving images |
| video |  | The media consists of a series of frames that capture a moving image |
| audio |  | The media consists of a sound recording |

These codes are used in the following places:

* [Media.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#media.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.235 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.235) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/medication-admin-status

A set of codes indicating the current status of a MedicationAdministration

Formal value Set definition (identifier **http://hl7.org/fhir/vs/medication-admin-status**): [XML](http://hl7.org/implement/standards/fhir/medication-admin-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-admin-status)) or [JSON](http://hl7.org/implement/standards/fhir/medication-admin-status.json).

This value set defines its own codesones defined internally:

## MedicationAdministrationStatus

A set of codes indicating the current status of a MedicationAdministration Tie this into the HL7 V3 Event act state model for administration

This value set defines its own terms in the system http://hl7.org/fhir/medication-admin-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| active |  | The administration of the medication has started and is currently in progress. |
| paused |  | The administration of the medication has started but is currently stopped with a firm intention of restarting. |
| completed |  | The administration of the medication has finished |
| nullified |  | The administration of the medication was recorded in error and the record should now be disregarded. |

These codes are used in the following places:

* [MedicationAdministration.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.92 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.92) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/medication-dispense-status

A code specifying the state of the dispense event.

Formal value Set definition (identifier **http://hl7.org/fhir/vs/medication-dispense-status**): [XML](http://hl7.org/implement/standards/fhir/medication-dispense-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-dispense-status)) or [JSON](http://hl7.org/implement/standards/fhir/medication-dispense-status.json).

This value set defines its own codesones defined internally:

## MedicationDispenseStatus

A code specifying the state of the dispense event. Tie this into the HL7 V3 Event act state model for administration

This value set defines its own terms in the system http://hl7.org/fhir/medication-dispense-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| active |  |  |
| paused |  |  |
| completed |  |  |
| nullified |  |  |

These codes are used in the following places:

* [MedicationDispense.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense.def)
* [MedicationDispense.dispense.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.101 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.101) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
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| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/medication-kind

Whether the medication is a product or a package

Formal value Set definition (identifier **http://hl7.org/fhir/vs/medication-kind**): [XML](http://hl7.org/implement/standards/fhir/medication-kind.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-kind)) or [JSON](http://hl7.org/implement/standards/fhir/medication-kind.json).

This value set defines its own codesones defined internally:

## MedicationKind

Whether the medication is a product or a package

This value set defines its own terms in the system http://hl7.org/fhir/medication-kind

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| product |  |  |
| package |  |  |

These codes are used in the following places:

* [Medication.kind](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.110 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.110) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/medication-prescription-status

A code specifying the state of the prescribing event.

Formal value Set definition (identifier **http://hl7.org/fhir/vs/medication-prescription-status**): [XML](http://hl7.org/implement/standards/fhir/medication-prescription-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-prescription-status)) or [JSON](http://hl7.org/implement/standards/fhir/medication-prescription-status.json).

This value set defines its own codesones defined internally:

## MedicationPrescriptionStatus

A code specifying the state of the prescribing event. Tie this into the HL7 V3 Event act state model for administration

This value set defines its own terms in the system http://hl7.org/fhir/medication-prescription-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| active |  | The prescribing of the medication has started and is currently in progress. |
| held |  | The prescribing of the medication has started but is currently stopped with a firm intention of restarting. |
| completed |  | The prescribing of the medication has finished |
| entered in error |  | The prescribing of the medication was recorded in error and the record should now be disregarded. |
| stopped |  | The prescription has been terminated prior to the originally intended completion |
| cancelled |  | The prescription has been terminated before it started |

These codes are used in the following places:

* [MedicationPrescription.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.107 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.107) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/message-conformance-event-mode

The mode of a message conformance statement

Formal value Set definition (identifier **http://hl7.org/fhir/vs/message-conformance-event-mode**): [XML](http://hl7.org/implement/standards/fhir/message-conformance-event-mode.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-conformance-event-mode)) or [JSON](http://hl7.org/implement/standards/fhir/message-conformance-event-mode.json).

This value set defines its own codesones defined internally:

## ConformanceEventMode

The mode of a message conformance statement

This value set defines its own terms in the system http://hl7.org/fhir/message-conformance-event-mode

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| sender |  | The application sends requests and receives responses |
| receiver |  | The application receives requests and sends responses |

These codes are used in the following places:

* [Conformance.messaging.event.mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.45 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.45) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/message-transport

How messages are delivered

Formal value Set definition (identifier **http://hl7.org/fhir/vs/message-transport**): [XML](http://hl7.org/implement/standards/fhir/message-transport.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-transport)) or [JSON](http://hl7.org/implement/standards/fhir/message-transport.json).

This value set defines its own codesones defined internally:

## MessageTransport

How messages are delivered

This value set defines its own terms in the system http://hl7.org/fhir/message-transport

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| http |  | The application sends or receives messages using HTTP POST (may be over http or https) |
| ftp |  | The application sends or receives messages using File Transfer Protocol |
| mllp |  | The application sends or receivers messages using HL7's Minimal Lower Level Protocol |

These codes are used in the following places:

* [Conformance.messaging.event.protocol](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.46 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.46) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/modality

Type of data in the instance

Formal value Set definition (identifier **http://hl7.org/fhir/vs/modality**): [XML](http://hl7.org/implement/standards/fhir/modality.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#modality)) or [JSON](http://hl7.org/implement/standards/fhir/modality.json).

This is a value set with codes taken from [http://nema.org/dicom/dcid (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim):

## Modality

Type of data in the instance

This value set includes codes defined in other code systems, using the following rules:

* Include these codes as defined in [http://nema.org/dicom/dcid (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicom-dcim)

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| AR | Autorefraction | Autorefraction device |
| AU | Audio | Audio object |
| BDUS | Ultrasound Bone Densitometry | Ultrasound Bone Densitometry (modality) |
| BI | Biomagnetic imaging | Biomagnetic imaging device |
| BMD | Bone Mineral Densitometry | Bone Mineral Densitometry by X-Ray (modality), including dual-energy X-Ray absorptiometry (DXA) and morphometric X-Ray absorptiometry (MXA) |
| CR | Computed Radiography | Computed Radiography device |
| CT | Computed Tomography | Computed Tomography device |
| DG | Diaphanography | Diaphanography device |
| DOC |  |  |
| DX | Digital Radiography | Digital Radiography device |
| ECG | Electrocardiography | Electrocardiography device |
| EPS | Cardiac Electrophysiology | Cardiac Electrophysiology device |
| ES | Endoscopy | Endoscopy device |
| FID |  |  |
| GM | General Microscopy | General Microscopy device |
| HC | Hard Copy | Hard Copy |
| HD | Hemodynamic Waveform | Hemodynamic Waveform acquisition device |
| IO | Intra-oral Radiography | Intra-oral Radiography device |
| IOL |  |  |
| IVOCT |  |  |
| IVUS | Intravascular Ultrasound | Intravascular Ultrasound device |
| KER | Keratometry | Keratometry device |
| KO | Key Object Selection | Key Object Selection object |
| LEN | Lensometry | Lensometry device |
| LS | Laser surface scan | Laser surface scan device |
| MG | Mammography | Mammography device |
| MR | Magnetic Resonance | Magnetic Resonance device |
| NM | Nuclear Medicine | Nuclear Medicine device |
| OAM | Ophthalmic Axial Measurements | Measurements of the axial length of the eye which are done by various devices |
| OCT | Optical Coherence Tomography | Modality device that uses an interferometric, non-invasive optical tomographic technique to image 2D slices and 3D volumes of tissue using visible and near visible frequencies. |
| OP | Ophthalmic photography | Ophthalmic photography modality |
| OPM | Ophthalmic Mapping | Modality device that measures corneal topography, corneal or retinal thickness, and other similar parameters that are typically displayed as maps. |
| OPT | Ophthalmic Tomography | Tomography of the eye acquired by a modality that is based on light and optical principles. Tomography based on other principles, such as ultrasound, is excluded. |
| OPV | Ophthalmic Visual Field | Modality device that measures visual fields and perform visual perimetry. |
| OT | Other Modality | Other Modality device |
| PLAN |  |  |
| PR | Presentation State | Presentation State object |
| PT | Positron emission tomography | Positron emission tomography (PET) device |
| PX | Panoramic X-Ray | Panoramic X-Ray device |
| REG | Registration | Registration |
| RESP |  |  |
| RF | Radiofluoroscopy | Radiofluoroscopy device |
| RG | Radiographic imaging | Radiographic imaging (conventional film/screen) |
| RTDOSE | Radiotherapy Dose | Radiotherapy Dose |
| RTIMAGE | Radiotherapy Image | Radiotherapy Imaging device; includes portal imaging |
| RTPLAN | Radiotherapy Plan | Radiotherapy Plan |
| RTRECORD | Radiotherapy Treatment Record | Radiotherapy Treatment Record |
| RTSTRUCT | Radiotherapy Structure Set | Radiotherapy Structure Set |
| SEG | Segmentation | Segmentation |
| SM | Slide Microscopy | Slide Microscopy |
| SMR | Stereometric Relationship | Stereometric image pairing modality |
| SR | Structured Report Document | Structured Report Document |
| SRF | Subjective Refraction | Subjective Refraction device |
| TG | Thermography | Thermography device |
| US | Ultrasound | Ultrasound device |
| VA | Visual Acuity | Visual Acuity device |
| XA | X-Ray Angiography | X-Ray Angiography device |
| XC | External-camera Photography | External-camera Photography device |

These codes are used in the following places:

* [ImagingStudy.series.modality](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.230 1.2.840.10008.6.1.811 (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/name-part-qualifier

A set of codes each of which specifies a certain subcategory of the name part in addition to the main name part type

Formal value Set definition (identifier **http://hl7.org/fhir/vs/name-part-qualifier**): [XML](http://hl7.org/implement/standards/fhir/name-part-qualifier.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#name-part-qualifier)) or [JSON](http://hl7.org/implement/standards/fhir/name-part-qualifier.json).

This is a value set with codes taken from <http://hl7.org/fhir/v3/EntityNamePartQualifier2>:

## EntityNamePartQualifier

A set of codes each of which specifies a certain subcategory of the name part in addition to the main name part type

This value set includes codes defined in other code systems, using the following rules:

* Include these codes as defined in http://hl7.org/fhir/v3/EntityNamePartQualifier2

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| LS |  |  |
| AC |  |  |
| NB |  |  |
| PR |  |  |
| HON |  |  |
| BR |  |  |
| AD |  |  |
| SP |  |  |
| MID |  |  |
| CL |  |  |
| IN |  |  |

These codes are not currently used

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.192 (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/name-use

The use of a human name

Formal value Set definition (identifier **http://hl7.org/fhir/vs/name-use**): [XML](http://hl7.org/implement/standards/fhir/name-use.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#name-use)) or [JSON](http://hl7.org/implement/standards/fhir/name-use.json).

This value set defines its own codesones defined internally:

## NameUse

The use of a human name

This value set defines its own terms in the system http://hl7.org/fhir/name-use

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| usual |  | Known as/conventional/the one you normally use |
| official |  | The formal name as registered in an official (government) registry, but which name might not be commonly used. May be called "legal name". |
| temp |  | A temporary name. A name valid time can provide more detailed information. This may also be used for temporary names assigned at birth or in emergency situations. |
| nickname |  | A name that is used to address the person in an informal manner, but is not part of their formal or usual name |
| anonymous |  | Anonymous assigned name, alias, or pseudonym (used to protect a person's identity for privacy reasons) |
| old |  | This name is no longer in use (or was never correct, but retained for records) |
| maiden |  | A name used prior to marriage. Marriage naming customs vary greatly around the world. This name use is for use by applications that collect and store "maiden" names. Though the concept of maiden name is often gender specific, the use of this term is not gender specific. The use of this term does not imply any particular history for a person's name, nor should the maiden name be determined algorithmically. |

These codes are used in the following places:

* [HumanName.use (§1.4.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.HumanName)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.15 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.15) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/narrative-status

The status of a resource narrative

Formal value Set definition (identifier **http://hl7.org/fhir/vs/narrative-status**): [XML](http://hl7.org/implement/standards/fhir/narrative-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#narrative-status)) or [JSON](http://hl7.org/implement/standards/fhir/narrative-status.json).

This value set defines its own codesones defined internally:

## NarrativeStatus

The status of a resource narrative

This value set defines its own terms in the system http://hl7.org/fhir/narrative-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| generated |  | The contents of the narrative are entirely generated from the structured data in the resource. |
| extensions |  | The contents of the narrative are entirely generated from the structured data in the resource and some of the content is generated from extensions |
| additional |  | The contents of the narrative contain additional information not found in the structured data |
| empty |  | the contents of the narrative are some equivalent of "No human readable text provided for this resource" |

These codes are used in the following places:

* [Narrative.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#formats.Narrative)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.28 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.28) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/network-type

the type of network access point that originated the audit event

Formal value Set definition (identifier **http://hl7.org/fhir/vs/network-type**): [XML](http://hl7.org/implement/standards/fhir/network-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#network-type)) or [JSON](http://hl7.org/implement/standards/fhir/network-type.json).

This value set defines its own codesones defined internally:

## SecurityEventParticipantNetworkType

the type of network access point that originated the audit event

This value set defines its own terms in the system http://hl7.org/fhir/network-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| name |  | Machine Name, including DNS name |
| ip |  | IP Address |
| phone |  | Telephone Number |
| email |  | Email address |
| uri |  | URI (User directory, HTTP-PUT, ftp, etc.) |

These codes are used in the following places:

* [SecurityEvent.participant.network.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.164 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.164) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/object-lifecycle

Identifier for the data life-cycle stage for the participant object

Formal value Set definition (identifier **http://hl7.org/fhir/vs/object-lifecycle**): [XML](http://hl7.org/implement/standards/fhir/object-lifecycle.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-lifecycle)) or [JSON](http://hl7.org/implement/standards/fhir/object-lifecycle.json).

This value set defines its own codesones defined internally:

## SecurityEventObjectLifecycle

Identifier for the data life-cycle stage for the participant object

This value set defines its own terms in the system http://hl7.org/fhir/object-lifecycle

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| 1 |  | Origination / Creation |
| 2 |  | Import / Copy from original |
| 3 |  | Amendment |
| 4 |  | Verification |
| 5 |  | Translation |
| 6 |  | Access / Use |
| 7 |  | De-identification |
| 8 |  | Aggregation, summarization, derivation |
| 9 |  | Report |
| 10 |  | Export / Copy to target |
| 11 |  | Disclosure |
| 12 |  | Receipt of disclosure |
| 13 |  | Archiving |
| 14 |  | Logical deletion |
| 15 |  | Permanent erasure / Physical destruction |

These codes are used in the following places:

* [SecurityEvent.object.lifecycle](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.168 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.168) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/object-role

Code representing the functional application role of Participant Object being audited

Formal value Set definition (identifier **http://hl7.org/fhir/vs/object-role**): [XML](http://hl7.org/implement/standards/fhir/object-role.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-role)) or [JSON](http://hl7.org/implement/standards/fhir/object-role.json).

This value set defines its own codesones defined internally:

## SecurityEventObjectRole

Code representing the functional application role of Participant Object being audited

This value set defines its own terms in the system http://hl7.org/fhir/object-role

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| 1 | Patient | A person or animal that is the subject of care for the event |
| 2 | Location | A physical or logical location related to the event |
| 3 | Report | A resource that is immutable and stored |
| 4 | Resource | A resource that is either changeable or not even persisted |
| 5 | Master file | An administrative record |
| 6 | User | A logical agent involved in the event (deprecated) |
| 7 | List | (deprecated) |
| 8 | Doctor | A person providing healthcare related to the event (deprecated) |
| 9 | Subscriber | A system requesting/receiving notification related to the event |
| 10 | Guarantor | A person or organisation who accepts responsibility for paying for healthcare provision the event contributes to |
| 11 | Security User Entity | A logical agent involved in the event |
| 12 | Security User Group | A user-role related to the event |
| 13 | Security Resource | A policy (e.g. consent directive) related to the event |
| 14 | Security Granularity Definition | Deprecated |
| 15 | Practitioner | A human or organization providing care the event occurs in the context of |
| 16 | Data Destination | A system that was the target of communications related to the event |
| 17 | Data Repository | A system holding resources related to the event |
| 18 | Schedule | A schedule resource related to the event |
| 19 | Customer | A person or animal that is the subject of services (not patient) related to the event |
| 20 | Job | A task in an IT system related to the event |
| 21 | Job Stream | A sub-task in an IT system related to the event |
| 22 | Table | A database table related to the event (deprecated) |
| 23 | Routing Criteria | A rule for how information related to the event is distributed |
| 24 | Query | A request for information related to the event |

These codes are used in the following places:

* [SecurityEvent.object.role](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.167 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.167) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/object-type

Code for the participant object type being audited

Formal value Set definition (identifier **http://hl7.org/fhir/vs/object-type**): [XML](http://hl7.org/implement/standards/fhir/object-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-type)) or [JSON](http://hl7.org/implement/standards/fhir/object-type.json).

This value set defines its own codesones defined internally:

## SecurityEventObjectType

Code for the participant object type being audited

This value set defines its own terms in the system http://hl7.org/fhir/object-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| 1 |  | Person |
| 2 |  | System Object |
| 3 |  | Organization |
| 4 |  | Other |

These codes are used in the following places:

* [SecurityEvent.object.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.166 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.166) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

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| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
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# Codes defined in http://hl7.org/fhir/observation-reliability

Codes that provide reliability information about an observation

Formal value Set definition (identifier **http://hl7.org/fhir/vs/observation-reliability**): [XML](http://hl7.org/implement/standards/fhir/observation-reliability.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-reliability)) or [JSON](http://hl7.org/implement/standards/fhir/observation-reliability.json).

This value set defines its own codesones defined internally:

## ObservationReliability

Codes that provide reliability information about an observation

This value set defines its own terms in the system http://hl7.org/fhir/observation-reliability

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| ok |  | The result has no reliability concerns |
| ongoing |  | An early estimate of value; measurement is still occurring |
| early |  | An early estimate of value; processing is still occurring |
| questionable |  | The observation value should be treated with care |
| calibrating |  | The result has been generated while calibration is occurring |
| error |  | The observation could not be completed because of an error |
| unknown |  | No observation value was available |

These codes are used in the following places:

* [Observation.reliability](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.118 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.118) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

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| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/observation-status

Codes providing the status of an observation

Formal value Set definition (identifier **http://hl7.org/fhir/vs/observation-status**): [XML](http://hl7.org/implement/standards/fhir/observation-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status)) or [JSON](http://hl7.org/implement/standards/fhir/observation-status.json).

This value set defines its own codesones defined internally:

## ObservationStatus

Codes providing the status of an observation

This value set defines its own terms in the system http://hl7.org/fhir/observation-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| registered |  | The existence of the observation is registered, but there is no result yet available |
| interim |  | This is an initial or interim observation: data may be incomplete or unverified |
| final |  | The observation is complete and verified by an authorised person |
| amended |  | The observation has been modified subsequent to being Final, and is complete and verified by an authorised person |
| cancelled |  | The observation is unavailable because the measurement was not started or not completed (also sometimes called "aborted") |
| withdrawn |  | The observation has been withdrawn following previous Final release |

These codes are used in the following places:

* [Questionnaire.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire.def)
* [DiagnosticReport.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport.def)
* [Observation.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.7 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.7) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

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| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/order-outcome-code

The status of the response to an order

Formal value Set definition (identifier **http://hl7.org/fhir/vs/order-outcome-code**): [XML](http://hl7.org/implement/standards/fhir/order-outcome-code.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-outcome-code)) or [JSON](http://hl7.org/implement/standards/fhir/order-outcome-code.json).

This value set defines its own codesones defined internally:

## OrderOutcomeCode

The status of the response to an order

This value set defines its own terms in the system http://hl7.org/fhir/order-outcome-code

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| pending |  |  |
| review |  |  |
| rejected |  |  |
| error |  |  |
| accepted |  |  |
| cancelled |  |  |
| aborted |  |  |
| complete |  |  |

These codes are used in the following places:

* [OrderResponse.code](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.124 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.124) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

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| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/participant-type

Kind of participation

Formal value Set definition (identifier **http://hl7.org/fhir/vs/participant-type**): [XML](http://hl7.org/implement/standards/fhir/participant-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#participant-type)) or [JSON](http://hl7.org/implement/standards/fhir/participant-type.json).

This value set defines its own codesones defined internally:

## ParticipantType

Kind of participation

This value set defines its own terms in the system http://hl7.org/fhir/participant-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| admitter |  |  |
| discharger |  |  |
| responsible |  |  |
| attending |  |  |
| consulting |  |  |
| emergency-contact |  |  |
| discharge-contact |  |  |

These codes are used in the following places:

* [Encounter.participant.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.183 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.183) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/picture-type

The type of image in the picture

Formal value Set definition (identifier **http://hl7.org/fhir/vs/picture-type**): [XML](http://hl7.org/implement/standards/fhir/picture-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-type)) or [JSON](http://hl7.org/implement/standards/fhir/picture-type.json).

This value set defines its own codes and includes codes taken from ones defined internally <urn:oid:1.2.840.10008.2.16.4>:

## PictureType

The type of image in the picture

This value set defines its own terms in the system http://hl7.org/fhir/picture-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| DIA |  | Hand-drawn diagram |

In addition, this value set includes codes defined in other code systems, using the following rules:

* Include these codes as defined in urn:oid:1.2.840.10008.2.16.4

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| AR |  |  |
| AU |  |  |
| BDUS |  |  |
| BI |  |  |
| BMD |  |  |
| CR |  |  |
| CT |  |  |
| DG |  |  |
| DOC |  |  |
| DX |  |  |
| ECG |  |  |
| EM |  |  |
| EPS |  |  |
| ES |  |  |
| FID |  |  |
| GM |  |  |
| HC |  |  |
| HD |  |  |
| IO |  |  |
| IOL |  |  |
| IVOCT |  |  |
| IVUS |  |  |
| KO |  |  |
| KER |  |  |
| LEN |  |  |
| LS |  |  |
| MG |  |  |
| MR |  |  |
| NM |  |  |
| OAM |  |  |
| OCT |  |  |
| OPM |  |  |
| OPT |  |  |
| OPV |  |  |
| OT |  |  |
| PLAN |  |  |
| PR |  |  |
| PT |  |  |
| PX |  |  |
| REG |  |  |
| RESP |  |  |
| RF |  |  |
| RG |  |  |
| RTDOSE |  |  |
| RTIMAGE |  |  |
| RTPLAN |  |  |
| RTRECORD |  |  |
| RTSTRUCT |  |  |
| SC |  |  |
| SEG |  |  |
| SM |  |  |
| SMR |  |  |
| SR |  |  |
| SRF |  |  |
| TG |  |  |
| US |  |  |
| VA |  |  |
| VL |  |  |
| XA |  |  |
| XC |  |  |

These codes are used in the following places:

* [Picture.modality](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.231 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.231) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/procedure-relationship-type

the nature of the relationship

Formal value Set definition (identifier **http://hl7.org/fhir/vs/procedure-relationship-type**): [XML](http://hl7.org/implement/standards/fhir/procedure-relationship-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-relationship-type)) or [JSON](http://hl7.org/implement/standards/fhir/procedure-relationship-type.json).

This value set defines its own codesones defined internally:

## ProcedureRelationshipType

the nature of the relationship

This value set defines its own terms in the system http://hl7.org/fhir/procedure-relationship-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| caused-by |  |  |
| caused |  |  |

These codes are used in the following places:

* [Procedure.relatedItem.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.136 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.136) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/provenance-participant-role

The role that a provenance participant played

Formal value Set definition (identifier **http://hl7.org/fhir/vs/provenance-participant-role**): [XML](http://hl7.org/implement/standards/fhir/provenance-participant-role.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-role)) or [JSON](http://hl7.org/implement/standards/fhir/provenance-participant-role.json).

This value set defines its own codesones defined internally:

## ProvenanceParticipantRole

The role that a provenance participant played

This value set defines its own terms in the system http://hl7.org/fhir/provenance-participant-role

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| enterer |  | A person entering the data into the originating system |
| performer |  | A person, animal, organization or device that who actually and principally carries out the activity |
| author |  | A party that originates the resource and therefore has responsibility for the information given in the resource and ownership of this resource |
| verifier |  | A person who verifies the correctness and appropriateness of activity |
| attestor |  | A verifier who attests to the accuracy of the resource |
| informant |  | A person who reported information that contributed to the resource |
| source |  | An information source from which the portions of the resource are derived |
| cc |  | A party, who may or should receive or who has received a copy of the resource or subsequent or derivative information of that resource |
| application |  | An application with a user interface that interacts with a person |
| daemon |  | A background process that transfers information from one place or form to another |

These codes are used in the following places:

* [Provenance.party.role](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.153 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.153) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/provenance-participant-type

The type of a provenance participant

Formal value Set definition (identifier **http://hl7.org/fhir/vs/provenance-participant-type**): [XML](http://hl7.org/implement/standards/fhir/provenance-participant-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-type)) or [JSON](http://hl7.org/implement/standards/fhir/provenance-participant-type.json).

This value set defines its own codesones defined internally:

## ProvenanceParticipantType

The type of a provenance participant

This value set defines its own terms in the system http://hl7.org/fhir/provenance-participant-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| resource |  | The participant is a resource itself. The id is a reference to the resource |
| person |  | The participant is a person acting on their own behalf or on behalf of the patient rather than as an practitioner for an organization. I.e. "not a healthcare provider" |
| practitioner |  | The participant is a practitioner |
| organization |  | The participant is an organization |
| software |  | The participant is a software application |
| record |  | The participant is a logical record. The record itself participated in the activity |
| document |  | The participant is a document |

These codes are used in the following places:

* [Provenance.party.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.152 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.152) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/quantity-comparator

how the Quantity should be understood and represented

Formal value Set definition (identifier **http://hl7.org/fhir/vs/quantity-comparator**): [XML](http://hl7.org/implement/standards/fhir/quantity-comparator.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#quantity-comparator)) or [JSON](http://hl7.org/implement/standards/fhir/quantity-comparator.json).

This value set defines its own codesones defined internally:

## QuantityCompararator

how the Quantity should be understood and represented

This value set defines its own terms in the system http://hl7.org/fhir/quantity-comparator

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| < |  | The actual value is less than the given value |
| <= |  | The actual value is less than or equal to the given value |
| >= |  | The actual value is greater than or equal to the given value |
| > |  | The actual value is greater than the given value |

These codes are used in the following places:

* [Quantity.comparator (§1.4.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Quantity)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.14 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.14) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/query-outcome

The outcome of processing a query request

Formal value Set definition (identifier **http://hl7.org/fhir/vs/query-outcome**): [XML](http://hl7.org/implement/standards/fhir/query-outcome.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-outcome)) or [JSON](http://hl7.org/implement/standards/fhir/query-outcome.json).

This value set defines its own codesones defined internally:

## QueryOutcome

The outcome of processing a query request

This value set defines its own terms in the system http://hl7.org/fhir/query-outcome

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| ok |  | The query was processed successfully |
| limited |  | The query was processed successfully, but some additional limitations were added |
| refused |  | The server refused to process the query |
| error |  | The server tried to process the query, but some error occurred |

These codes are used in the following places:

* [Query.response.outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#query.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.157 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.157) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/reactionSeverity

The severity of an adverse reaction.

Formal value Set definition (identifier **http://hl7.org/fhir/vs/reactionSeverity**): [XML](http://hl7.org/implement/standards/fhir/reactionSeverity.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#reactionSeverity)) or [JSON](http://hl7.org/implement/standards/fhir/reactionSeverity.json).

This value set defines its own codesones defined internally:

## ReactionSeverity

The severity of an adverse reaction.

This value set defines its own terms in the system http://hl7.org/fhir/reactionSeverity

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| severe |  | Severe complications arose due to the reaction |
| serious |  | Serious inconvenience to the subject |
| moderate |  | Moderate inconvenience to the subject |
| minor |  | Minor inconvenience to the subject |

These codes are used in the following places:

* [AdverseReaction.symptom.severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.29 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.29) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/resource-profile-status

The lifecycle status of a Resource Profile

Formal value Set definition (identifier **http://hl7.org/fhir/vs/resource-profile-status**): [XML](http://hl7.org/implement/standards/fhir/resource-profile-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-profile-status)) or [JSON](http://hl7.org/implement/standards/fhir/resource-profile-status.json).

This value set defines its own codesones defined internally:

## ResourceProfileStatus

The lifecycle status of a Resource Profile

This value set defines its own terms in the system http://hl7.org/fhir/resource-profile-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| draft |  | This profile is still under development |
| active |  | This profile is ready for normal use |
| retired |  | This profile has been withdrawn or superseded and should no longer be used |

These codes are used in the following places:

* [Profile.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.147 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.147) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/resource-slicing-rules

How slices are interpreted when evaluating an instance

Formal value Set definition (identifier **http://hl7.org/fhir/vs/resource-slicing-rules**): [XML](http://hl7.org/implement/standards/fhir/resource-slicing-rules.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-slicing-rules)) or [JSON](http://hl7.org/implement/standards/fhir/resource-slicing-rules.json).

This value set defines its own codesones defined internally:

## SlicingRules

How slices are interpreted when evaluating an instance

This value set defines its own terms in the system http://hl7.org/fhir/resource-slicing-rules

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| closed |  | No additional content is allowed other than that described by the slices in this profile |
| open |  | Additional content is allowed anywhere in the list |
| openAtEnd |  | Additional content is allowed, but only at the end of the list |

These codes are used in the following places:

* [Profile.structure.element.slicing.rules](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.265 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.265) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/response-code

The kind of response to a message

Formal value Set definition (identifier **http://hl7.org/fhir/vs/response-code**): [XML](http://hl7.org/implement/standards/fhir/response-code.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#response-code)) or [JSON](http://hl7.org/implement/standards/fhir/response-code.json).

This value set defines its own codesones defined internally:

## ResponseCode

The kind of response to a message

This value set defines its own terms in the system http://hl7.org/fhir/response-code

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| ok |  | The message was accepted and processed without error |
| error |  | Some internal unexpected error occurred - wait and try again. Note - this is usually used for things like database unavailable, which may be expected to resolve, though human intervention may be required |
| rejection |  | The message was rejected because of some content in it. There is no point in re-sending without change. The response narrative must describe what the issue is. |
| rules |  | The message was rejected because of some event-specific business rules, and it may be possible to modify the request and re-submit (as a different request). The response must include an Issue report that describes what problem is |
| undeliverable |  | A middleware agent was unable to deliver the message to its intended destination |

These codes are used in the following places:

* [Message.response.code](http://hl7.org/implement/standards/fhir/fhir-book.htm#message.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.113 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.113) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/restful-conformance-mode

The mode of a restful conformance statement

Formal value Set definition (identifier **http://hl7.org/fhir/vs/restful-conformance-mode**): [XML](http://hl7.org/implement/standards/fhir/restful-conformance-mode.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-conformance-mode)) or [JSON](http://hl7.org/implement/standards/fhir/restful-conformance-mode.json).

This value set defines its own codesones defined internally:

## RestfulConformanceMode

The mode of a restful conformance statement

This value set defines its own terms in the system http://hl7.org/fhir/restful-conformance-mode

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| client |  | The application acts as a server for this resource |
| server |  | The application acts as a client for this resource |

These codes are used in the following places:

* [Conformance.rest.mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.42 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.42) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/restful-operation

Operations supported by REST

Formal value Set definition (identifier **http://hl7.org/fhir/vs/restful-operation**): [XML](http://hl7.org/implement/standards/fhir/restful-operation.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-operation)) or [JSON](http://hl7.org/implement/standards/fhir/restful-operation.json).

This value set defines its own codesones defined internally:

## RestfulOperation

Operations supported by REST

This value set defines its own terms in the system http://hl7.org/fhir/restful-operation

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| read | read | Read the current state of the resource |
| vread | vread | Read the state of a specific version of the resource |
| update | update | Update an existing resource by its id (or create it if it is new) |
| delete | delete | Delete a resource |
| history-instance | history-instance | Retrieve the update history for a resource instance |
| validate | validate | Check that the content would be acceptable as an update |
| history-type | history-type | Get a list of updates to resources of this type |
| create | create | Create a new resource with a server assigned id |
| search | search | Supports search operations using the parameters described in the profile |
| transaction | transaction | Transaction performed on multiple resources |
| history-sytem | history-sytem | Get a list of updates to all resources on the system |

These codes are used in the following places:

* [Conformance.rest.resource.operation.code](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance.def)
* Included in Valueset [Audit Event Type Code (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sub-type)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.44 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.44) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/restful-security-service

Types of security services used with FHIR

Formal value Set definition (identifier **http://hl7.org/fhir/vs/restful-security-service**): [XML](http://hl7.org/implement/standards/fhir/restful-security-service.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-security-service)) or [JSON](http://hl7.org/implement/standards/fhir/restful-security-service.json).

This value set defines its own codesones defined internally:

## RestfulSecurityService

Types of security services used with FHIR

This value set defines its own terms in the system http://hl7.org/fhir/restful-security-service

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| OAuth |  | OAuth (see oauth.net) |
| OAuth2 |  | OAuth version 2 (see oauth.net) |
| NTLM |  | Microsoft NTLM Authentication |
| Basic |  | Basic authentication defined in HTTP specification |
| Kerberos |  | see… |

These codes are used in the following places:

* [Conformance.rest.security.service](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.43 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.43) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/search-param-type

Data types allowed to be used for search parameters

Formal value Set definition (identifier **http://hl7.org/fhir/vs/search-param-type**): [XML](http://hl7.org/implement/standards/fhir/search-param-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type)) or [JSON](http://hl7.org/implement/standards/fhir/search-param-type.json).

This value set defines its own codesones defined internally:

## SearchParamType

Data types allowed to be used for search parameters

This value set defines its own terms in the system http://hl7.org/fhir/search-param-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| integer |  | Search parameter must be a simple whole number |
| string |  | Search parameter is a simple string, like a name part. Search is case-insensitive and accent-insensitive. May match just the start of a string. String parameters may contain spaces and are delineated by double quotes, e.g. "van Zanten". |
| text |  | Search parameter is on a long string. Used for text filter type search: it functions on searches within a body of text and may contain spaces to separate words. May match even if the separate words are found out of order. Text parameters are delineated by double quotes. |
| date |  | Search parameter is on a date (and should support :before and :after modifiers). The date format is the standard XML format, though other formats may be supported |
| token |  | Search parameter on a coded element or identifier. May be used to search through the text, displayname, code and code/codesystem (for codes) and label, system and key (for identifier). Its value is either a string or a pair of namespace and value, separated by a "!". |
| reference |  | A pair of resource type and resource id, separated by "/". Matches when the resource reference resolves to a resource of the given type and id. |
| composite |  | A composite search parameter that combines other search parameters together |

These codes are used in the following places:

* [Conformance.rest.resource.searchParam.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance.def)
* [Profile.structure.searchParam.type](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.9 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.9) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/security-event-action

Indicator for type of action performed during the event that generated the audit.

Formal value Set definition (identifier **http://hl7.org/fhir/vs/security-event-action**): [XML](http://hl7.org/implement/standards/fhir/security-event-action.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action)) or [JSON](http://hl7.org/implement/standards/fhir/security-event-action.json).

This value set defines its own codesones defined internally:

## SecurityEventAction

Indicator for type of action performed during the event that generated the audit.

This value set defines its own terms in the system http://hl7.org/fhir/security-event-action

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| C | Create | Create a new database object, such as Placing an Order. |
| R | Read/View/Print | Display or print data, such as a Doctor Census |
| U | Update | Update data, such as Revise Patient Information |
| D | Delete | Delete items, such as a doctor master file record |
| E | Execute | Perform a system or application function such as log-on, program execution or use of an object's method, or perform a query/search operation |

These codes are used in the following places:

* [SecurityEvent.event.action](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.210 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.210) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/security-event-outcome

Indicates whether the event succeeded or failed

Formal value Set definition (identifier **http://hl7.org/fhir/vs/security-event-outcome**): [XML](http://hl7.org/implement/standards/fhir/security-event-outcome.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-outcome)) or [JSON](http://hl7.org/implement/standards/fhir/security-event-outcome.json).

This value set defines its own codesones defined internally:

## SecurityEventOutcome

Indicates whether the event succeeded or failed

This value set defines its own terms in the system http://hl7.org/fhir/security-event-outcome

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| 0 | Success | The operation completed successfully (whether with warnings or not) |
| 4 | Minor failure | The action was not successful due to some kind of catered for error (often equivalent to an HTTP 400 response) |
| 8 | Serious failure | The action was not successful due to some kind of unexpected error (often equivalent to an HTTP 500 response) |
| 12 | Major failure | An error of such magnitude occurred that the system is no longer available for use (i.e. the system died) |

These codes are used in the following places:

* [SecurityEvent.event.outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.211 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.211) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/sensitivitystatus

The status of the adverse sensitivity

Formal value Set definition (identifier **http://hl7.org/fhir/vs/sensitivitystatus**): [XML](http://hl7.org/implement/standards/fhir/sensitivitystatus.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitystatus)) or [JSON](http://hl7.org/implement/standards/fhir/sensitivitystatus.json).

This value set defines its own codesones defined internally:

## SensitivityStatus

The status of the adverse sensitivity

This value set defines its own terms in the system http://hl7.org/fhir/sensitivitystatus

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| suspected |  | A suspected sensitivity to a substance |
| confirmed |  | The sensitivity has been confirmed and is active |
| refuted |  | The sensitivity has been shown to never have existed |
| resolved |  | The sensitivity used to exist but no longer does |

These codes are used in the following places:

* [AllergyIntolerance.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.35 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.35) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/sensitivitytype

The type of an adverse sensitivity

Formal value Set definition (identifier **http://hl7.org/fhir/vs/sensitivitytype**): [XML](http://hl7.org/implement/standards/fhir/sensitivitytype.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitytype)) or [JSON](http://hl7.org/implement/standards/fhir/sensitivitytype.json).

This value set defines its own codesones defined internally:

## SensitivityType

The type of an adverse sensitivity

This value set defines its own terms in the system http://hl7.org/fhir/sensitivitytype

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| allergy |  | Allergic Reaction |
| intolerance |  | Non-Allergic Reaction |
| unknown |  | Unknown type |

These codes are used in the following places:

* [AllergyIntolerance.sensitivityType](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.34 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.34) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/special-values

A set of generally useful codes defined so they can be included in value sets

Formal value Set definition (identifier **http://hl7.org/fhir/vs/special-values**): [XML](http://hl7.org/implement/standards/fhir/special-values.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#special-values)) or [JSON](http://hl7.org/implement/standards/fhir/special-values.json).

This value set defines its own codesones defined internally:

## SpecialValues

A set of generally useful codes defined so they can be included in value sets

This value set defines its own terms in the system http://hl7.org/fhir/special-values

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| true | true | Boolean true |
| false | false | Boolean false |
| trace | Trace Amount Detected | The content is greater than zero, but too small to be quantified |
| sufficient | Sufficient Quantity | The specific quantity is not known, but is known to be non-zero and is not specified because it makes up the bulk of the material |
| withdrawn | Value Withdrawn | The value is no longer available |
| nil known | Nil Known | The are no known applicable values in this context |

These codes are not currently used

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.10 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.10) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

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| --- | --- |
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| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/units-of-time

A unit of time (units from UCUM)

Formal value Set definition (identifier **http://hl7.org/fhir/vs/units-of-time**): [XML](http://hl7.org/implement/standards/fhir/units-of-time.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#units-of-time)) or [JSON](http://hl7.org/implement/standards/fhir/units-of-time.json).

This is a value set with codes taken from [http://unitsofmeasure.org](http://unitsofmeasure.org/):

## UnitsOfTime

A unit of time (units from UCUM)

This value set includes codes defined in other code systems, using the following rules:

* Include these codes as defined in http://unitsofmeasure.org

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| s |  |  |
| min |  |  |
| h |  |  |
| d |  |  |
| wk |  |  |
| mo |  |  |
| a |  |  |

These codes are used in the following places:

* [Schedule.repeat.units (§1.4.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Schedule)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.20 (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/valueset-status

The lifecycle status of a Value Set

Formal value Set definition (identifier **http://hl7.org/fhir/vs/valueset-status**): [XML](http://hl7.org/implement/standards/fhir/valueset-status.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-status)) or [JSON](http://hl7.org/implement/standards/fhir/valueset-status.json).

This value set defines its own codesones defined internally:

## ValueSetStatus

The lifecycle status of a Value Set

This value set defines its own terms in the system http://hl7.org/fhir/valueset-status

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| draft |  | This valueset is still under development |
| active |  | This valueset is ready for normal use |
| retired |  | This valueset has been withdrawn or superseded and should no longer be used |

These codes are used in the following places:

* [ValueSet.status](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset.def)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.178 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.178) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

# Codes defined in http://hl7.org/fhir/xds-relationship-type

The kind of relationship between two XDS documents

Formal value Set definition (identifier **http://hl7.org/fhir/vs/xds-relationship-type**): [XML](http://hl7.org/implement/standards/fhir/xds-relationship-type.xml) ([for browser](http://hl7.org/implement/standards/fhir/fhir-book.htm#xds-relationship-type)) or [JSON](http://hl7.org/implement/standards/fhir/xds-relationship-type.json).

This value set defines its own codesones defined internally:

## XDSRelationshipType

The kind of relationship between two XDS documents

This value set defines its own terms in the system http://hl7.org/fhir/xds-relationship-type

|  |  |  |
| --- | --- | --- |
| **Code** | **Display** | **Definition** |
| APND |  | A separate XDS Document that references a prior document, and may extend or alter the observations in the prior document |
| RPLC |  | A new version of an existing document |
| XFRM |  | A transformed document is derived by a machine translation from some other format |
| XFRM\_RPLC |  | Both a XFRM and a RPLC relationship |
| signs |  | This document signs the target document |

These codes are used in the following places:

* [Extension relationship.type (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#xds-profile.relationship.type)

See [the full registry of codes (§5.2.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#terminologies-codes) defined as part of FHIR.

The OID for the value set is 2.16.840.1.113883.4.642.2.242 (and the OID for the implicit code system is 2.16.840.1.113883.4.642.1.242) (OIDs are not used in FHIR, but may be used in v3, or OID based terminology systems).

Explanation of the columns that may appear on this page:

|  |  |
| --- | --- |
| Id | The internal identifier for the concept (when the value set defines its own codes) |
| Level | A few code lists that FHIR defines are hierarchical - each code is assigned a level. In this scheme, some codes are "under" others, and imply that the code they are under also applies |
| Source | The source of the definition of the code (when the value set draws in codes defined elsewhere) |
| Code | The code (used as the code in the resource instance) |
| Display | The display (used in the *display* element of a [Coding (§1.4.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#datatypes.Coding)) |
| Definition | An explanation of the meaning of the concept |
| Comments | Additional notes about how to use the code |

### 5.3.1: Resource Format - Formal Definitions

#### 5.3.1.1: Narrative

|  |  |
| --- | --- |
| **Narrative** | |
| Definition | A human readable formatted text, including images |
| Control | 1..1 |
| **Narrative.status** | |
| Definition | The status of the narrative - whether it's entirely generated (from just the defined data or the extensions too), or whether a human authored it and it may contain additional data |
| Control | 1..1 |
| Binding | NarrativeStatus : The status of a resource narrative (see [http://hl7.org/fhir/narrative-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#narrative-status) for values) |
| Type | code from NarrativeStatus |
| **Narrative.div** | |
| Definition | The actual narrative content, a stripped down version of XHTML |
| Control | 1..1 |
| Type | xhtml |
| Comments | The contents of the html element are an XHTML fragment containing only the basic html formatting elements described in chapters 7-11 and 15 of the HTML 4.0 standard, <a> elements (either name or href), images and internally contained stylesheets. The XHTML content may not contain a head, a body, external stylesheet references, scripts, forms, base/link/xlink, frames, iframes and objects. |

### 5.4.1: Data Type Formal Definitions

This page provides the formal definitions for the data types

#### 5.4.1.1: Attachment

|  |  |
| --- | --- |
| **Attachment** | |
| Definition | For referring to data content defined in other formats. |
| Control | 1..1 |
| Requirements | Many models need to include data defined in other specifications that is complex and opaque to the healthcare model. This includes documents, media recordings, structured data, etc. |
| **Attachment.contentType** | |
| Definition | Identifies the type of the data in the attachment and allows a method to be chosen to interpret or render the data. Includes mime type parameters such as charset where appropriate |
| Control | 1..1 |
| Binding | MimeType : see [BCP 13 (RFCs 2045, 2046, 2047, 4288, 4289 and 2049) (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) |
| Type | code from MimeType |
| Requirements | Processors of the data need to be able to tell what the data is |
| **Attachment.language** | |
| Definition | The human language of the content. The value can be any valid value according to BCP 47 |
| Control | 0..1 |
| Binding | Language : see [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |
| Type | code from Language |
| Requirements | Users need to be able to pick between the languages in a set of attachments |
| **Attachment.data** | |
| Definition | The actual data of the attachment - a sequence of bytes. In XML, represented using base64 |
| Control | 0..1 |
| Type | base64Binary |
| Requirements | The data needs to able to be transmitted inline |
| Comments | The base64-encoded data must be expressed in the same character set as the base resource XML |
| To Do | Should this be handled by an extension? How common is it? |
| **Attachment.url** | |
| Definition | An alternative location where the data can be accessed |
| Control | 0..1 |
| Type | uri |
| Requirements | The data needs to be transmitted by reference |
| Comments | If both data and url are provided, the url must point to the same content as the data contains. Urls may be relative references or may be made to transient locations such as a wrapping envelope using cid: though this has ramifications for using signatures. If a URL is provided, it must resolve to actual data. |
| To Do | Sort out relative URL references |
| **Attachment.size** | |
| Definition | The number of bytes of data that make up this attachment. |
| Control | 0..1 |
| Type | integer |
| Requirements | Representing the size allows applications to determine whether they should fetch the content automatically in advance, or refuse to fetch it at all |
| Comments | The number of bytes is redundant if the data is provided as a base64binary, but is useful if the data is provided as a url reference |
| **Attachment.hash** | |
| Definition | The calculated hash of the data using SHA-1. Represented using base64 |
| Control | 0..1 |
| Type | base64Binary |
| Requirements | Included so that applications can verify that the contents of a location have not changed and also so that a signature of the xml content can implicitly sign the content of an image without having to include the data in the instance or reference the url in the signature |
| **Attachment.title** | |
| Definition | A label or set of text to display in place of the data |
| Control | 0..1 |
| Type | string |
| Requirements | Applications need a label to display to a human user in place of the actual data if the data cannot be rendered or perceived by the viewer. |

#### 5.4.1.2: Identifier

|  |  |
| --- | --- |
| **Identifier** | |
| Definition | A technical identifier - identifies some entity uniquely and unambiguously |
| Control | 1..1 |
| Requirements | Need to be able to identify things with confidence and be sure that the identification is not subject to misinterpretation |
| Comments | the Identifier class is a little looser than II because it allows URIs as well as registered OIDs or GUIDs |
| **Identifier.use** | |
| Definition | Identifies the use for this identifier, if known |
| Control | 0..1 |
| Binding | IdentifierUse : Identifies the use for this identifier, if known (see [http://hl7.org/fhir/identifier-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#identifier-use) for values) |
| Type | code from IdentifierUse |
| Must Understand | true |
| Requirements | Allows the appropriate identifier for a particular context of use to be selected from among a set of identifiers |
| Comments | This is labelled as "Is Modifier" because applications should not mistake a temporary id for a permanent one. Applications can assume that an identifier is not temporary unless it explicitly says that it is |
| **Identifier.label** | |
| Definition | A label for the identifier that can be displayed to a human so they can recognise the identifier |
| Control | 0..1 |
| Type | string |
| Requirements | Allows humans to make use of identifiers when the identifier system is not known |
| **Identifier.system** | |
| Definition | Establishes the namespace in which set of possible id values is unique. |
| Control | 0..1 |
| Type | uri |
| Requirements | There are many sequences of identifiers. To perform matching, we need to know what sequence we're dealing with. |
| **Identifier.key** | |
| Definition | The portion of the identifier typically displayed to the user and which is unique within the context of the system. |
| Control | 0..1 |
| Type | string |
| Comments | if the key value is actually a full uri, then the system is urn:ietf:rfc:3986 |
| **Identifier.period** | |
| Definition | Time period during which identifier was valid for use |
| Control | 0..1 |
| Type | Period |
| **Identifier.assigner** | |
| Definition | Organisation that issued/manages the identifier |
| Control | 0..1 |
| Type | Resource(Organization) |
| Comments | The reference may be just a text description of the assigner |

#### 5.4.1.3: Coding

|  |  |
| --- | --- |
| **Coding** | |
| Definition | A reference to a code defined by a terminology system |
| Control | 1..1 |
| Requirements | Referring to codes is a ubiquitous task in healthcare models |
| Comments | Codes may defined very casually in enumerations or code lists, up to very formal definitions such as SNOMED-CT - see the v3 core principles for more information |
| **Coding.system** | |
| Definition | The identification of the system that defines the meaning of the symbol in the code. Can be a simple list of enumerations, a list of codes with meanings or all the way to a complex semantic web such as SNOMED-CT, whether classification, terminology, or ontology |
| Control | 0..1 |
| Type | uri |
| Requirements | Need to be unambiguous about the source of the definition of the symbol |
| Comments | The identity is a uri. It may be an OID or a UUID, which must be references to the HL7 OID registry, or a URI which either comes from HL7's list of FHIR defined special URIs or from some system defined elsewhere, in which case the URI should de-reference to establish the system unambiguously |
| **Coding.code** | |
| Definition | A symbol in syntax defined by the system. The symbol may be a predefined code or an expression in a syntax defined by the coding system |
| Control | 0..1 |
| Type | code |
| Requirements | Need to refer to a particular code in the system |
| **Coding.display** | |
| Definition | A representation of the meaning of the code in the system, following the rules laid out by the system. |
| Control | 0..1 |
| Type | string |
| Requirements | Need to be able to carry a human readable meaning of the code for readers that do not recognise the system |
| To Do | language? |

#### 5.4.1.4: CodeableConcept

|  |  |
| --- | --- |
| **CodeableConcept** | |
| Definition | A concept that may be defined by a formal reference to a terminology or ontology or may be provided by text |
| Control | 1..1 |
| Requirements | This is a common pattern in healthcare - a concept that may be defined by one or more codes from formal definitions including LOINC and SNOMED-CT, and/or defined by the provision of text that captures a human sense of the concept |
| Comments | Not all terminology uses fit this general pattern. In some cases, models should not use CodeableConcept and use Coding directly and provide their own structure for managing text, codings, translations and the relationship between elements and pre- and post-coordination |
| Invariants | **Defined on this element** **Inv-2**: If a primary reference is present, it must point to one of the codings (xpath: not(exists(f:primary)) or count(f:coding[@id=current()/f:primary/@value])=1) |
| **CodeableConcept.coding** | |
| Definition | A reference to a code defined by a terminology system |
| Control | 0..\* |
| Type | Coding |
| Requirements | Allows for translations and alternate encodings within a code system. Also supports communication of the same instance to systems requiring different encodings. |
| Comments | Codes may defined very casually in enumerations, or code lists, up to very formal definitions such as SNOMED-CT - see the v3 core principles for more information. Ordering of codings is undefined and must not be used to infer meaning. |
| **CodeableConcept.text** | |
| Definition | A human language representation of the concept as seen/selected/uttered by the user who entered the data and/or which represents the intended meaning of the user or concept |
| Control | 0..1 |
| Type | string |
| Requirements | The codes from the terminologies do not always capture the correct meaning with all the nuances of the human, or sometimes there is no appropriate code at all. In these cases, the text is used to capture the full meaning of the source |
| Comments | Very often the text is the same as a displayName of one of the codings |
| **CodeableConcept.primary** | |
| Definition | Indicates which of the codes in the codings was chosen by a user, if one was chosen directly |
| Control | 0..1 |
| Type | idref |
| Requirements | Where a user picks an actual code directly, it is useful to note that this is the primary input. It's also the most appropriate starting point for new translations (unless re-coding directly from 'text'). |

#### 5.4.1.5: Choice

|  |  |
| --- | --- |
| **Choice** | |
| Definition | A code taken from a short list of codes that are not defined in a formal code system |
| Control | 1..1 |
| Requirements | Questionnaires and the like - assessment scales. There's no formal terminology underlying them, yet the possible choices affect the interpretation of the code. Because the choice can be quite dynamic, the price of setting up formal infrastructure to carry the choices out of band is expensive |
| Comments | Choice is generally used for things like pain scales, questionnaires or formally defined assessment indexes. The possible codes may be ordered with some arbitrarily defined scale. Choice does not fit all assessment scales - the more combinatorial the value is, the less likely that Choice will be an appropriate data type |
| **Choice.code** | |
| Definition | The code or value that the user selected from the list of possible codes |
| Control | 0..1 |
| Type | code |
| Comments | The "code" might be a numerical choice in a pain scale, for instance, 1 where the choices are 1-5 with associated words for severity of pain |
| **Choice.option** | |
| Definition | A list of possible values for the code |
| Control | 1..\* |
| Requirements | Need to know the possible codes the user could have chosen |
| **Choice.option.code** | |
| Definition | A possible code or value that the user could have chosen |
| Control | 1..1 |
| Type | code |
| Requirements | Need to know the possible codes the user could have chosen |
| **Choice.option.display** | |
| Definition | A set of words associated with the code to give it meaning and displayed to the user |
| Control | 0..1 |
| Type | string |
| Requirements | Sometimes the codes have associated words that give it more meaning |
| Comments | The code itself may convey sufficient meaning. If there aren't both a code and a display provided, the display string is presumed to be the code. |
| **Choice.isOrdered** | |
| Definition | Whether the order of the values has an assigned meaning |
| Control | 0..1 |
| Type | boolean |
| Requirements | The Choice may come from an ordered scale such as a pain scale or a an assessment scale, or it may be just a random set of choices that have no particular order |

#### 5.4.1.6: Quantity

|  |  |
| --- | --- |
| **Quantity** | |
| Definition | A measured amount (or an amount that can potentially be measured). Note that measured amounts include amounts that are not precisely quantified, including amounts involving arbitrary units and floating currencies |
| Control | 1..1 |
| Requirements | Need to able to capture all sorts of measured values, even if the measured value are not precisely quantified. Values include exact measures such as 3.51g, customary units such as 3 tablets, currencies such as $100.32USD |
| Comments | The context of use may frequently define what kind of quantity this is and therefore what kind of units can be used. The context of use may also restrict the values for status |
| Invariants | **Defined on this element** **Inv-3**: If a code for the units is present, the system must also be present (xpath: not(exists(f:code)) or exists(f:system)) |
| **Quantity.value** | |
| Definition | The value of the measured amount. The value includes an implicit precision in the presentation of the value |
| Control | 0..1 |
| Type | decimal |
| Requirements | Precision is handled implicitly in almost all cases of measurement |
| Comments | The implicit precision should always be honored. Currency has its own rules for handling precision |
| **Quantity.comparator** | |
| Definition | How the value should be understood and represented - whether the actual value is greater or less than the stated value due to measurement issues. E.g. if the comparator is "<" , then the real value is < stated value |
| Control | 0..1 |
| Binding | QuantityCompararator : how the Quantity should be understood and represented (see [http://hl7.org/fhir/quantity-comparator](http://hl7.org/implement/standards/fhir/fhir-book.htm#quantity-comparator) for values) |
| Type | code from QuantityCompararator |
| Must Understand | true |
| Requirements | Need a framework for handling measures where the value is <5ug/L or >400mg/L due to the limitations of measuring methodology. |
| Comments | This is labelled as "Is Modifier" because the comparator modifies the interpretation of the value significantly. If there is no comparator, then there is no impact |
| **Quantity.units** | |
| Definition | A human readable form of the units |
| Control | 0..1 |
| Type | string |
| Requirements | There are lots of representations for the units and in many contexts, particular representations are fixed and required. i.e. mcg for micrograms and not ug |
| **Quantity.system** | |
| Definition | The identification of the system that provides the coded form of the unit |
| Control | 0..1 |
| Type | uri |
| Requirements | Need to know the system that defines the coded form of the unit |
| Invariants | **Affect this element** **Inv-3**: If a code for the units is present, the system must also be present (xpath: not(exists(f:code)) or exists(f:system)) |
| **Quantity.code** | |
| Definition | A computer processable form of the units in some unit representation system |
| Control | 0..1 |
| Type | code |
| Requirements | Need a computable form of the units that is fixed across all forms. UCUM provides this for quantities, but SNOMED-CT provides many arbitrary units of interest |
| Comments | The preferred system is UCUM, but SNOMED-CT can also be used (for customary units) or ISO 4217 for currency. The context of use may additionally require a code from a particular system (Unless the Quantity element has a dataAbsentReason flag) |

#### 5.4.1.7: Range

|  |  |
| --- | --- |
| **Range** | |
| Definition | A set of ordered Quantities defined by a low and high limit. |
| Control | 1..1 |
| Requirements | Need to be able to specify ranges of values or time periods |
| Comments | The stated low and high value are assumed to have arbitrarily high precision when it comes to determining which values are in the range. i.e. 1.99 is not in the range 2 -> 3 |
| Invariants | **Defined on this element** **Inv-3**: Quantity values cannot have a range when used in a Range (xpath: not(exists(f:low/f:range) or exists(f:high/f:range))) |
| **Range.low** | |
| Definition | The low limit. The boundary is inclusive. |
| Control | 0..1 |
| Type | Quantity |
| Comments | If the low element is missing, the meaning is that the low boundary is not known. |
| Invariants | **Affect this element** **Inv-3**: Quantity values cannot have a range when used in a Range (xpath: not(exists(f:low/f:range) or exists(f:high/f:range))) |
| **Range.high** | |
| Definition | The high limit. The boundary is inclusive. |
| Control | 0..1 |
| Type | Quantity |
| Comments | If the high element is missing, the meaning is that the high boundary is not known. |
| Invariants | **Affect this element** **Inv-3**: Quantity values cannot have a range when used in a Range (xpath: not(exists(f:low/f:range) or exists(f:high/f:range))) |

#### 5.4.1.8: Ratio

|  |  |
| --- | --- |
| **Ratio** | |
| Definition | A ratio of two Quantity values - a numerator and a denominator. |
| Control | 1..1 |
| Requirements | Need to able to capture ratios for some measurements (titers) and some rates (costs) |
| **Ratio.numerator** | |
| Definition | The numerator |
| Control | 0..1 |
| Type | Quantity |
| **Ratio.denominator** | |
| Definition | The denominator |
| Control | 0..1 |
| Type | Quantity |

#### 5.4.1.9: Period

|  |  |
| --- | --- |
| **Period** | |
| Definition | A time period defined by a start and end time. |
| Control | 1..1 |
| Comments | Not a duration - that's a measure of time (a separate type), but a duration that occurs at a fixed value of time. A Period specifies a range of time; the context of use will specify whether the entire range applies (e.g. "the patient was an inpatient of the hospital for this time range") or one value from the range applies (e.g. "give to the patient between these two times"). If a duration might be required, specify the type as Interval|Duration |
| **Period.start** | |
| Definition | The start of the period. The boundary is inclusive. |
| Control | 0..1 |
| Type | dateTime |
| Comments | If the low element is missing, the meaning is that the low boundary is not known. |
| **Period.end** | |
| Definition | The end of the period. If the high is missing, it means that the period is ongoing |
| Control | 0..1 |
| Type | dateTime |
| Comments | The high value includes any matching date/time. i.e. 2012-02-03T10:00:00 is in a period that has an end value of 2012-02-03 |

#### 5.4.1.10: HumanName

|  |  |
| --- | --- |
| **HumanName** | |
| Definition | A human's name with the ability to identify parts and usage |
| Control | 1..1 |
| Requirements | Need to be able to record names, along with notes about their use |
| Comments | Names may be changed, or repudiated, or people may have different names in different contexts. Names may be divided into parts of different type that have variable significance depending on context, though the division into parts does not always matter. With personal names, the different parts may or may not be imbued with some implicit meaning; various cultures associate different importance with the name parts, and the degree to which systems must care about name parts around the world varies widely. |
| **HumanName.use** | |
| Definition | Identifies the purpose for this name |
| Control | 0..1 |
| Binding | NameUse : The use of a human name (see [http://hl7.org/fhir/name-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#name-use) for values) |
| Type | code from NameUse |
| Must Understand | true |
| Requirements | Allows the appropriate name for a particular context of use to be selected from among a set of names |
| Comments | This is labelled as "Is Modifier" because applications should not mistake a temporary or old name etc. for a current/permanent one. Applications can assume that a name is not temporary or old unless it explicitly says that it is |
| **HumanName.text** | |
| Definition | A full text representation of the name |
| Control | 0..1 |
| Type | string |
| Requirements | A renderable, unencoded form |
| Comments | Can provide both a text representation and structured parts. |
| **HumanName.family** | |
| Definition | Family name, this is the name that links to the genealogy. In some cultures (e.g. Eritrea) the family name of a son is the first name of his father. |
| Control | 0..\* |
| Type | string |
| Aliases | surname |
| Comments | family name is allowed to repeat. A single family name with spaces is equivalent to multiple family names with the same values |
| **HumanName.given** | |
| Definition | Given name. NOTE: Not to be called "first name" since given names do not always come first. |
| Control | 0..\* |
| Type | string |
| Aliases | first name; middle name |
| **HumanName.prefix** | |
| Definition | Part of the name that is acquired as a title due to academic, legal, employment or nobility status, etc. and that comes at the start of the name |
| Control | 0..\* |
| Type | string |
| **HumanName.suffix** | |
| Definition | Part of the name that is acquired as a title due to academic, legal, employment or nobility status, etc. and that comes at the end of the name |
| Control | 0..\* |
| Type | string |
| **HumanName.period** | |
| Definition | Indicates the period of time when this name was valid for the named person. |
| Control | 0..1 |
| Type | Period |
| Requirements | Allows names to be placed in historical context |

#### 5.4.1.11: Address

|  |  |
| --- | --- |
| **Address** | |
| Definition | There is a variety of postal address formats defined around the world. This format defines a superset that is the basis for addresses all around the world |
| Control | 1..1 |
| Requirements | Need to be able to record postal addresses, along with notes about their use |
| Comments | Note: address is for postal addresses, not physical locations |
| **Address.use** | |
| Definition | Identifies the intended purpose of this address |
| Control | 0..1 |
| Binding | AddressUse : The use of an address (see [http://hl7.org/fhir/address-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#address-use) for values) |
| Type | code from AddressUse |
| Must Understand | true |
| Requirements | Allows an appropriate address to be chosen from a list of many |
| Comments | This is labelled as "Is Modifier" because applications should not mistake a temporary or old address etc. for a current/permanent one. Applications can assume that an address is not temporary or old unless it explicitly says that it is |
| **Address.text** | |
| Definition | A full text representation of the address |
| Control | 0..1 |
| Type | string |
| Requirements | A renderable, unencoded form |
| Comments | Can provide both a text representation and parts |
| **Address.line** | |
| Definition | A line of an address (typically used for street names & numbers, unit details, delivery hints, etc.) . |
| Control | 0..\* |
| Type | string |
| **Address.city** | |
| Definition | The name of the city, town, village or other community or delivery centre. |
| Control | 0..1 |
| Type | string |
| Aliases | Municipality |
| **Address.state** | |
| Definition | Sub-unit of a country with limited sovereignty in a federally organized country. A code may be used if codes are in common use (i.e. US 2 letter state codes). |
| Control | 0..1 |
| Type | string |
| Aliases | Province; Territory |
| **Address.zip** | |
| Definition | A postal code designating a region defined by the postal service. |
| Control | 0..1 |
| Type | string |
| Aliases | PostCode |
| **Address.country** | |
| Definition | Country. ISO 3166 3 letter codes can be used in place of a full country name. |
| Control | 0..1 |
| Type | string |
| **Address.period** | |
| Definition | Time period when address was/is in use |
| Control | 0..1 |
| Type | Period |
| Requirements | Allows addresses to be placed in historical context |

#### 5.4.1.12: Contact

|  |  |
| --- | --- |
| **Contact** | |
| Definition | All kinds of technology mediated contact details for a person or organisation, including telephone, email, etc. |
| Control | 1..1 |
| Requirements | Need to track phone, fax, mobile, sms numbers, email addresses, twitter tags, etc. |
| Invariants | **Defined on this element** **Inv-2**: A system is required if a value is provided. (xpath: not(exists(f:value)) or exists(f:system)) |
| **Contact.system** | |
| Definition | What kind of contact this is - what communications system is required to make use of the contact |
| Control | 0..1 |
| Binding | ContactSystem : What kind of contact this is (see [http://hl7.org/fhir/contact-system](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-system) for values) |
| Type | code from ContactSystem |
| Invariants | **Affect this element** **Inv-2**: A system is required if a value is provided. (xpath: not(exists(f:value)) or exists(f:system)) |
| **Contact.value** | |
| Definition | The actual contact details, in a form that is meaningful to the designated communication system (i.e. phone number or email address). |
| Control | 0..1 |
| Type | string |
| Requirements | Need to support legacy numbers that are not in a tightly controlled format |
| Comments | additional out of band data such as extensions, or notes about use of the contact are sometimes included in the value |
| **Contact.use** | |
| Definition | Identifies the context for the address |
| Control | 0..1 |
| Binding | ContactUse : How to use this address (see [http://hl7.org/fhir/contact-use](http://hl7.org/implement/standards/fhir/fhir-book.htm#contact-use) for values) |
| Type | code from ContactUse |
| Must Understand | true |
| Requirements | Need to track the way a person uses this contact, so a user can choose which is appropriate for their purpose |
| Comments | This is labelled as "Is Modifier" because applications should not mistake a temporary or old contact etc. for a current/permanent one. Applications can assume that a contact is not temporary or old unless it explicitly says that it is |
| **Contact.period** | |
| Definition | Time period when the contact was/is in use |
| Control | 0..1 |
| Type | Period |

#### 5.4.1.13: Schedule

|  |  |
| --- | --- |
| **Schedule** | |
| Definition | A schedule that specifies an event that may occur multiple times. Schedules are not used for recording when things did happen, but when they are expected or requested to occur. |
| Control | 1..1 |
| Requirements | Need to able to track schedules. There are several different ways to do scheduling: one or more specified times, a simple rules like three times a day, or to say, x before/after meals, or something like that |
| Comments | A schedule can be either a list of events - intervals on which the event occurs, or a single event with repeating criteria or just repeating criteria with no actual event. |
| Invariants | **Defined on this element** **Inv-1**: There can only be a repeat element if there is none or one event (xpath: not(exists(f:repeat)) or count(f:event) < 2) |
| **Schedule.event** | |
| Definition | Identifies specific time periods when the event should occur |
| Control | 0..\* |
| Type | Period |
| Requirements | Some schedules are just explicit lists of times |
| **Schedule.repeat** | |
| Definition | Identifies a repeating pattern to the intended time periods. |
| Control | 0..1 |
| Requirements | Many schedules are determined by regular repetitions |
| Comments | If present, the Schedule.event indicates the time of the first occurrence. |
| Invariants | **Defined on this element** **Inv-2**: Either frequency or when must be present, but not both (xpath: exists(f:frequency) != exists(f:when)) **Inv-3**: At most, only one of count and end can be present (xpath: not(exists(f:count) and exists(f:end)))**Affect this element** **Inv-1**: There can only be a repeat element if there is none or one event (xpath: not(exists(f:repeat)) or count(f:event) < 2) |
| **Schedule.repeat.frequency** | |
| Definition | Indicates how often the event should occur. |
| Control | 0..1 |
| Type | integer |
| Invariants | **Affect this element** **Inv-2**: Either frequency or when must be present, but not both (xpath: exists(f:frequency) != exists(f:when)) |
| **Schedule.repeat.when** | |
| Definition | Identifies the occurrence of daily life that determine timing |
| Control | 0..1 |
| Binding | EventTiming : A real world event that a schedule is related to (see [http://hl7.org/fhir/event-timing](http://hl7.org/implement/standards/fhir/fhir-book.htm#event-timing) for values) |
| Type | code from EventTiming |
| Requirements | Timings are frequently determined by occurrences such as waking, eating and sleep |
| Invariants | **Affect this element** **Inv-2**: Either frequency or when must be present, but not both (xpath: exists(f:frequency) != exists(f:when)) |
| **Schedule.repeat.duration** | |
| Definition | How long each repetition should last |
| Control | 1..1 |
| Type | decimal |
| Requirements | Some activities are not instantaneous and need to be maintained for a period of time |
| Invariants | **Defined on this element** **Inv-4**: duration must be a positive value (xpath: @value > 0 or not(@value))**Affect this element** **Inv-4**: duration must be a positive value (xpath: @value > 0 or not(@value)) |
| **Schedule.repeat.units** | |
| Definition | The units of time for the duration |
| Control | 1..1 |
| Binding | UnitsOfTime : A unit of time (units from UCUM) (see [http://hl7.org/fhir/units-of-time](http://hl7.org/implement/standards/fhir/fhir-book.htm#units-of-time) for values) |
| Type | code from UnitsOfTime |
| **Schedule.repeat.count** | |
| Definition | A total count of the desired number of repetitions |
| Control | 0..1 |
| Type | integer |
| Requirements | Repetitions may be limited by end time or total occurrences |
| Comments | An end need not be specified |
| Invariants | **Affect this element** **Inv-3**: At most, only one of count and end can be present (xpath: not(exists(f:count) and exists(f:end))) |
| **Schedule.repeat.end** | |
| Definition | When to stop repeats |
| Control | 0..1 |
| Type | dateTime |
| Requirements | Repetitions may be limited by end time or total occurrences |
| Comments | An end need not be specified |
| Invariants | **Affect this element** **Inv-3**: At most, only one of count and end can be present (xpath: not(exists(f:count) and exists(f:end))) |

### 5.5.1: Extensibility - Definitions

|  |  |
| --- | --- |
| **Extension** | |
| Definition | Optional Extensions Element - found in all resources |
| Control | 1..1 |
| Requirements | The ability to add extensions in a structured way is what keeps FHIR resources simple |
| Invariants | **Defined on this element** **Inv-1**: No extensions on url (xpath: not(exists(f:url/f:extension))) **Inv-2**: No extensions on isModifier (xpath: not(exists(f:isModifier/f:extension))) |
| **Extension.url** | |
| Definition | Source of the definition for the extension code - a logical name or a URL |
| Control | 1..1 |
| Type | uri |
| Comments | The definition may point directly to a computable or human readable definition of the extensibility codes, or it may be a logical URI as declared in some other specification. The definition should be version specific. This will ideally be the URI for the Resource Profile defining the extension, with the code for the extension after a # |
| Invariants | **Affect this element** **Inv-1**: No extensions on url (xpath: not(exists(f:url/f:extension))) |
| **Extension.isModifier** | |
| Definition | This value should be set to true if the value of the extension qualifies or negates data in other content |
| Control | 0..1 |
| Type | boolean |
| Must Understand | true |
| Comments | If this element is set to true, then the containing resource/element and its children are only safe to process if the reader understands this extension, and knows what the potential impact is. This does not mean that the application is required to do anything with the value, it is just not permitted to act inappropriately for any possible value in the element |
| Invariants | **Affect this element** **Inv-2**: No extensions on isModifier (xpath: not(exists(f:isModifier/f:extension))) |
| **Extension.value[x]** | |
| Definition | Value of extension - may be a resource or one of a constrained set of the data types (see Extensibility in the spec for list) |
| Control | 0..1 |
| Type | \* |

## 5.6: Resource Formal Definitions: AdverseReaction

The formal definitions for the [AdverseReaction (§3.1)](http://hl7.org/implement/standards/fhir/fhir-book.htm#adversereaction) resource.

|  |  |
| --- | --- |
| **AdverseReaction** | |
| Definition | AdverseReaction |
| Control | 1..1 |
| **AdverseReaction.reactionDate** | |
| Definition | When the reaction occurred |
| Control | 0..1 |
| Type | dateTime |
| **AdverseReaction.subject** | |
| Definition | The subject of the adverse reaction |
| Control | 1..1 |
| Type | Resource(Patient) |
| **AdverseReaction.didNotOccurFlag** | |
| Definition | To say that a reaction to substance did not occur |
| Control | 1..1 |
| Type | boolean |
| Must Understand | true |
| **AdverseReaction.recorder** | |
| Definition | Who recorded the reaction |
| Control | 0..1 |
| Type | Resource(Practitioner|Patient) |
| **AdverseReaction.symptom** | |
| Definition | The signs and symptoms that were observed as part of the reaction |
| Control | 0..\* |
| Aliases | Signs; Symptoms; Manifestations |
| **AdverseReaction.symptom.code** | |
| Definition | Indicates the specific sign or symptom that was observed |
| Control | 1..1 |
| Binding | SymptomType : see [ICD-10 Reaction codes (http://apps.who.int/classifications/icd10/browse/2010/en)](http://apps.who.int/classifications/icd10/browse/2010/en) |
| Type | CodeableConcept from SymptomType |
| **AdverseReaction.symptom.severity** | |
| Definition | The severity of the sign or symptom |
| Control | 0..1 |
| Binding | ReactionSeverity : The severity of an adverse reaction. (see [http://hl7.org/fhir/reactionSeverity](http://hl7.org/implement/standards/fhir/fhir-book.htm#reactionSeverity) for values) |
| Type | code from ReactionSeverity |
| **AdverseReaction.exposure** | |
| Definition | An exposure to a substance that preceded a reaction occurrence |
| Control | 0..\* |
| **AdverseReaction.exposure.exposureDate** | |
| Definition | When the exposure occurred |
| Control | 0..1 |
| Type | dateTime |
| **AdverseReaction.exposure.exposureType** | |
| Definition | Drug Administration, Immunization, Coincidental |
| Control | 0..1 |
| Binding | ExposureType : The type of exposure that resulted in an adverse reaction (see [http://hl7.org/fhir/exposureType](http://hl7.org/implement/standards/fhir/fhir-book.htm#exposureType) for values) |
| Type | code from ExposureType |
| **AdverseReaction.exposure.causalityExpectation** | |
| Definition | A statement of how confident that the recorder was that this exposure caused the reaction |
| Control | 0..1 |
| Binding | CausalityExpectation : How likely is it that the given exposure caused a reaction (see [http://hl7.org/fhir/causalityExpectation](http://hl7.org/implement/standards/fhir/fhir-book.htm#causalityExpectation) for values) |
| Type | code from CausalityExpectation |
| **AdverseReaction.exposure.substance** | |
| Definition | Substance(s) that is presumed to have caused the adverse reaction |
| Control | 0..1 |
| Type | Resource(Substance) |

## 5.7: Resource Formal Definitions: Alert

The formal definitions for the [Alert (§3.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert) resource.

|  |  |
| --- | --- |
| **Alert** | |
| Definition | Prospective warnings of things that should be taken notice of when providing care to the patient |
| Control | 1..1 |
| **Alert.category** | |
| Definition | Allows an alert to be divided int different categories like clinical, administrative etc. |
| Control | 0..1 |
| Type | CodeableConcept |
| **Alert.status** | |
| Definition | Supports basic workflow |
| Control | 1..1 |
| Binding | AlertStatus : Indicates whether this alert is active and needs to be displayed to a user, or whether it is no longer needed or entered in error (see [http://hl7.org/fhir/alert-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#alert-status) for values) |
| Type | code from AlertStatus |
| **Alert.subject** | |
| Definition | The person who this alert concerns |
| Control | 1..1 |
| Type | Resource(Patient) |
| **Alert.author** | |
| Definition | The person or device that created the alert |
| Control | 0..1 |
| Type | Resource(Practitioner|Patient|Device) |
| **Alert.note** | |
| Definition | The textual component of the alert to display to the user |
| Control | 1..1 |
| Type | string |

## 5.8: Resource Formal Definitions: AllergyIntolerance

The formal definitions for the [AllergyIntolerance (§3.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#allergyintolerance) resource.

|  |  |
| --- | --- |
| **AllergyIntolerance** | |
| Definition | Allergy/Intolerance |
| Control | 1..1 |
| Aliases | Adverse Sensitivity |
| **AllergyIntolerance.identifier** | |
| Definition | An external identifier for the sensitivity |
| Control | 0..1 |
| Type | Identifier |
| **AllergyIntolerance.criticality** | |
| Definition | Criticality of the sensitivity |
| Control | 0..1 |
| Binding | Criticality : The criticality of an adverse sensitivity (see [http://hl7.org/fhir/criticality](http://hl7.org/implement/standards/fhir/fhir-book.htm#criticality) for values) |
| Type | code from Criticality |
| **AllergyIntolerance.sensitivityType** | |
| Definition | Type of the sensitivity |
| Control | 1..1 |
| Binding | SensitivityType : The type of an adverse sensitivity (see [http://hl7.org/fhir/sensitivitytype](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitytype) for values) |
| Type | code from SensitivityType |
| **AllergyIntolerance.recordedDate** | |
| Definition | Date when the sensitivity was recorded |
| Control | 0..1 |
| Type | dateTime |
| **AllergyIntolerance.status** | |
| Definition | Suspected, Confirmed, Refuted, Resolved |
| Control | 1..1 |
| Binding | SensitivityStatus : The status of the adverse sensitivity (see [http://hl7.org/fhir/sensitivitystatus](http://hl7.org/implement/standards/fhir/fhir-book.htm#sensitivitystatus) for values) |
| Type | code from SensitivityStatus |
| Must Understand | true |
| **AllergyIntolerance.subject** | |
| Definition | Who the sensitivity is for |
| Control | 1..1 |
| Type | Resource(Patient) |
| **AllergyIntolerance.recorder** | |
| Definition | Who recorded the sensitivity |
| Control | 0..1 |
| Type | Resource(Practitioner|Patient) |
| **AllergyIntolerance.substance** | |
| Definition | The substance that causes the sensitivity |
| Control | 1..1 |
| Type | Resource(Substance) |
| **AllergyIntolerance.reactions** | |
| Definition | Reactions associated with the sensitivity |
| Control | 0..\* |
| Type | Resource(AdverseReaction) |
| **AllergyIntolerance.sensitivityTest** | |
| Definition | Observations that confirm or refute the sensitivity |
| Control | 0..\* |
| Type | Resource(Observation) |

## 5.9: Resource Formal Definitions: CarePlan

The formal definitions for the [CarePlan (§3.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#careplan) resource.

|  |  |
| --- | --- |
| **CarePlan** | |
| Definition | Describes the intention of how one or more practitioners intend to deliver care for a particular patient for a period of time, possibly limited to care for a specific condition or set of conditions. |
| Control | 1..1 |
| Aliases | Care Team |
| **CarePlan.identifier** | |
| Definition | Unique identifier by which the care plan is known in different business contexts. |
| Control | 0..1 |
| Type | Identifier |
| **CarePlan.patient** | |
| Definition | Identifies the patient/subject whose intended care is described by the plan. |
| Control | 1..1 |
| Type | Resource(Patient) |
| Requirements | Care plans must be associated with the patient the plan is for. |
| **CarePlan.status** | |
| Definition | Indicates whether the plan is currently being acted upon, represents future intentions or is now just historical record. |
| Control | 1..1 |
| Binding | CarePlanStatus : Indicates whether the plan is currently being acted upon, represents future intentions or is now just historical record. (see [http://hl7.org/fhir/care-plan-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-status) for values) |
| Type | code from CarePlanStatus |
| Must Understand | true |
| Requirements | Allows clinicians to determine whether the plan is actionable or not |
| **CarePlan.period** | |
| Definition | Indicates when the plan did (or is intended to) come into effect and end. |
| Control | 0..1 |
| Type | Period |
| Requirements | Allows tracking what plan(s) are in effect at a particular time. |
| Comments | Any activities scheduled as part of the plan should be constrained to the specified period. |
| **CarePlan.modified** | |
| Definition | Identifies the most recent date on which the plan has been revised. |
| Control | 0..1 |
| Type | dateTime |
| Requirements | Indicates how current the plan is. |
| **CarePlan.concern** | |
| Definition | Identifies the conditions/problems/concerns/diagnoses/etc. whose management and/or mitigation are handled by this plan. |
| Control | 0..\* |
| Type | Resource(Condition) |
| Requirements | Links plan to the conditions it manages. Also scopes plans - multiple plans may exist addressing different concerns. |
| **CarePlan.participant** | |
| Definition | Identifies all people and organizations who are expected to be involved in the care envisioned by this plan. |
| Control | 0..\* |
| Requirements | Allows representation of care teams, helps scope care plan. In some cases may be a determiner of access permissions. |
| Aliases | Care Team |
| **CarePlan.participant.role** | |
| Definition | Indicates specific responsibility of an individual within the care plan. E.g. "Primary physician", "Team coordinator", "Caregiver", etc. |
| Control | 0..1 |
| Binding | CarePlanParticipantRole : Indicates specific responsibility of an individual within the care plan. E.g. "Primary physician", "Team coordinator", "Caregiver", etc. |
| Type | CodeableConcept from CarePlanParticipantRole |
| Comments | Roles may sometimes be inferred by type of Practitioner. These are relationships that hold only within the context of the care plan. General relationships should be handled as properties of the Patient resource directly. |
| **CarePlan.participant.member** | |
| Definition | The specific person or organization who is participating/expected to participate in the care plan. |
| Control | 1..1 |
| Type | Resource(Practitioner|RelatedPerson|Patient|Organization) |
| Comments | Patient only needs to be listed if they have a role other than "subject of care" |
| **CarePlan.goal** | |
| Definition | Describes the intended objective(s) of carrying out the Care Plan. |
| Control | 0..\* |
| Requirements | Provides context for plan. Allows plan effectiveness to be evaluated by clinicians. |
| Comments | Goal can be achieving a particular change or merely maintaining a current state or even slowing a decline. |
| **CarePlan.goal.description** | |
| Definition | Human readable description of a specific desired objective of the care plan. |
| Control | 1..1 |
| Type | string |
| Requirements | Without a description of what's trying to be achieved, element has no purpose |
| **CarePlan.goal.status** | |
| Definition | Indicates whether the goal has been reached and is still considered relevant |
| Control | 0..1 |
| Binding | CarePlanGoalStatus : Indicates whether the goal has been met and is still being targeted (see [http://hl7.org/fhir/care-plan-goal-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-goal-status) for values) |
| Type | code from CarePlanGoalStatus |
| Requirements | Allows measuring outcome and also indicates relevance of goal to plan. |
| **CarePlan.goal.notes** | |
| Definition | Any comments related to the goal |
| Control | 0..1 |
| Type | string |
| Requirements | There's a need to capture information about the goal that doesn't actually describe the goal. |
| Comments | May be used for progress notes, concerns or other related information that doesn't actually describe the goal itself. |
| **CarePlan.activity** | |
| Definition | Identifies a planned action to occur as part of the plan. For example, a medication to be used, lab tests to perform, self-monitoring, education, etc. |
| Control | 0..\* |
| Requirements | Allows systems to prompt for performance of planned activities, validate plans against best practice. |
| Invariants | **Defined on this element** **Inv-1**: DailyDose can only be specified if activity category is drug or food (xpath: (f:category/@value=('drug','diet')) = exists(f:dailyAmount)) **Inv-2**: Quantity can only be specified if activity category is supply (xpath: (f:category/@value=('supply')) = exists(f:quantity)) |
| **CarePlan.activity.category** | |
| Definition | High-level categorization of the type of activity in a care plan. |
| Control | 1..1 |
| Binding | CarePlanActivityCategory : High-level categorization of the type of activity in a care plan. (see [http://hl7.org/fhir/care-plan-activity-category](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-category) for values) |
| Type | code from CarePlanActivityCategory |
| Requirements | May determine what types of extensions are permitted |
| **CarePlan.activity.code** | |
| Definition | Detailed description of the type of activity. E.g. What lab test, what procedure, what kind of encounter. |
| Control | 0..1 |
| Binding | CarePlanActivityCode : Detailed description of the type of activity. E.g. What lab test, what procedure, what kind of encounter. |
| Type | CodeableConcept from CarePlanActivityCode |
| Requirements | Allows matching performed to planned as well as validation against protocols |
| Comments | Tends to be less relevant for activities involving particular products. Codes should not convey negation - use "prohibited" instead. |
| **CarePlan.activity.status** | |
| Definition | Identifies what progress is being made for the specific activity. |
| Control | 0..1 |
| Binding | CarePlanActivityStatus : Indicates where the activity is at in its overall life cycle (see [http://hl7.org/fhir/care-plan-activity-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#care-plan-activity-status) for values) |
| Type | code from CarePlanActivityStatus |
| Requirements | Indicates progress against the plan, whether the activity is still relevant for the plan |
| Comments | Some aspects of Status can be inferred based on the resources linked in actionTaken. Note that "status" is only as current as the plan was most recently updated. |
| **CarePlan.activity.prohibited** | |
| Definition | If true, indicates that the described activity is one that must NOT be engaged in when following the plan. |
| Control | 1..1 |
| Type | boolean |
| Must Understand | true |
| Requirements | Captures intention to not do something that may have been previously typical. |
| **CarePlan.activity.timing[x]** | |
| Definition | The period, timing or frequency upon which the described activity is to occur. |
| Control | 0..1 |
| Type | Schedule|Period|string |
| Requirements | Allows prompting for activities and detection of missed planned activities. |
| **CarePlan.activity.location** | |
| Definition | Identifies the facility where the activity will occur. E.g. home, hospital, specific clinic, etc. |
| Control | 0..1 |
| Type | Resource(Location) |
| Requirements | Helps in planning of activity |
| Comments | May reference a specific clinical location or may just identify a type of location. |
| **CarePlan.activity.performer** | |
| Definition | Identifies who's expected to be involved in the activity. |
| Control | 0..\* |
| Type | Resource(Practitioner|Organization|RelatedPerson|Patient) |
| Requirements | Helps in planning of activity |
| **CarePlan.activity.product** | |
| Definition | Identifies the food, drug or other product being consumed or supplied in the activity. |
| Control | 0..1 |
| Type | Resource(Medication|Substance) |
| **CarePlan.activity.dailyAmount** | |
| Definition | Identifies the quantity expected to be consumed in a given day. |
| Control | 0..1 |
| Type | Quantity |
| Requirements | Allows rough dose checking |
| Aliases | daily dose |
| Invariants | **Affect this element** **Inv-1**: DailyDose can only be specified if activity category is drug or food (xpath: (f:category/@value=('drug','diet')) = exists(f:dailyAmount)) |
| **CarePlan.activity.quantity** | |
| Definition | Identifies the quantity expected to be supplied. |
| Control | 0..1 |
| Type | Quantity |
| Invariants | **Affect this element** **Inv-2**: Quantity can only be specified if activity category is supply (xpath: (f:category/@value=('supply')) = exists(f:quantity)) |
| **CarePlan.activity.details** | |
| Definition | This provides a textual description of constraints on the activity occurrence, including relation to other activities. It may also include objectives, pre-conditions and end-conditions. Finally, it may convey specifics about the activity such as body site, method, route, etc. |
| Control | 0..1 |
| Type | string |
| **CarePlan.activity.actionTaken** | |
| Definition | Resources that describe follow-on actions resulting from the plan, such as drug prescriptions, encounter records, appointments, etc. |
| Control | 0..\* |
| Type | Resource(Any) |
| Requirements | Links plan to resulting actions |
| **CarePlan.activity.notes** | |
| Definition | Notes about the execution of the activity |
| Control | 0..1 |
| Type | string |
| Requirements | Can be used to capture information about adherence, progress, concerns, etc. |
| Comments | Doesn't describe the activity - that goes in details. |
| **CarePlan.notes** | |
| Definition | General notes about the care plan not covered elsewhere |
| Control | 0..1 |
| Type | string |
| Requirements | Used to capture information that applies to the plan as a whole that doesn't fit into discrete elements. |

## 5.10: Resource Formal Definitions: Condition

The formal definitions for the [Condition (§3.5)](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition) resource.

|  |  |
| --- | --- |
| **Condition** | |
| Definition | Use to record detailed information about conditions, problems or diagnoses recognized by a clinician. There are many uses including: recording a Diagnosis during an Encounter; populating a problem List or a Summary Statement, such as a Discharge Summary |
| Control | 1..1 |
| To Do | \* Age is questionable, you might well need a range of Age or even (in practice) a text like "in their teens". => new ballot comment. \* Todo: discuss the applicability of assessing stages \* Change the description: it is circular |
| **Condition.subject** | |
| Definition | Subject of this condition |
| Control | 1..1 |
| Type | Resource(Patient) |
| **Condition.encounter** | |
| Definition | Encounter during which the condition was first asserted |
| Control | 0..1 |
| Type | Resource(Encounter) |
| **Condition.asserter** | |
| Definition | Person who takes responsibility for asserting the existence of the condition as part of the electronic record |
| Control | 0..1 |
| Type | Resource(Practitioner|Patient) |
| **Condition.dateAsserted** | |
| Definition | Estimated or actual date the condition/problem/diagnosis was first detected/suspected |
| Control | 0..1 |
| Type | date |
| **Condition.code** | |
| Definition | Identification of the condition, problem or diagnosis. |
| Control | 1..1 |
| Binding | ConditionCode : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-code)) |
| Type | CodeableConcept from ConditionCode |
| **Condition.category** | |
| Definition | A category assigned to the condition. E.g. finding | Condition | diagnosis | concern | condition |
| Control | 0..1 |
| Binding | ConditionCategory : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-category)) |
| Type | CodeableConcept from ConditionCategory |
| Comments | The categorization is often highly contextual and may appear poorly differentiated or not very useful in other contexts |
| **Condition.status** | |
| Definition | The clinical status of the condition |
| Control | 1..1 |
| Binding | ConditionStatus : The clinical status of the Condition or diagnosis (see [http://hl7.org/fhir/condition-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-status) for values) |
| Type | code from ConditionStatus |
| Must Understand | true |
| **Condition.certainty** | |
| Definition | The degree of confidence that this condition is correct |
| Control | 0..1 |
| Binding | ConditionCertainty : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-certainty)) |
| Type | CodeableConcept from ConditionCertainty |
| Must Understand | true |
| Comments | May be a percentage |
| **Condition.severity** | |
| Definition | A subjective assessment of the severity of the condition as evaluated by the clinician. |
| Control | 0..1 |
| Binding | ConditionSeverity : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-severity)) |
| Type | CodeableConcept from ConditionSeverity |
| Comments | Coding of the severity with a terminology is preferred, where possible |
| **Condition.onset[x]** | |
| Definition | Estimated or actual date the condition began, in the opinion of the clinician |
| Control | 0..1 |
| Type | date|Age |
| Comments | Age is generally used when the patient reports an age at which the Condition began to occur |
| **Condition.abatement[x]** | |
| Definition | The date or estimated date that the condition resolved or went into remission. This is called "abatement" because of the many overloaded connotations associated with "remission" or "resolution" - Conditions are never really resolved, but they can abate. |
| Control | 0..1 |
| Type | date|Age|boolean |
| Comments | There is no explicit distinction between resolution and remission because in many cases the distinction is not clear. Age is generally used when the patient reports an age at which the Condition abated. If there is no abatement element, it is unknown whether the condition has resolved or entered remission; applications and users should generally assume that the condition is still valid |
| **Condition.stage** | |
| Definition | Clinical stage or grade of a condition. May include formal severity assessments |
| Control | 0..1 |
| Invariants | **Defined on this element** **Inv-1**: Stage must have summary or assessment (xpath: exists(f:summary) or exists(f:assessment)) |
| **Condition.stage.summary** | |
| Definition | A simple summary of the stage such as "Stage 3". The determination of the stage is disease-specific |
| Control | 0..1 |
| Type | CodeableConcept |
| Invariants | **Affect this element** **Inv-1**: Stage must have summary or assessment (xpath: exists(f:summary) or exists(f:assessment)) |
| **Condition.stage.assessment** | |
| Definition | Reference to a formal record of the evidence on which the staging assessment is based |
| Control | 0..\* |
| Type | Resource(Any) |
| Invariants | **Affect this element** **Inv-1**: Stage must have summary or assessment (xpath: exists(f:summary) or exists(f:assessment)) |
| To Do | When an assessment resource / framework is developed, this will be changed from Any to something narrower |
| **Condition.evidence** | |
| Definition | Supporting Evidence / manifestations that are the basis on which this condition is suspected or confirmed |
| Control | 0..\* |
| Comments | The evidence may be a simple list of coded symptoms/manifestations, or references to observations or formal assessments, or both |
| Invariants | **Defined on this element** **Inv-2**: evidence must have code or details (xpath: exists(f:code) or exists(f:details)) |
| **Condition.evidence.code** | |
| Definition | A manifestation or symptom that led to the recording of this condition |
| Control | 0..1 |
| Type | CodeableConcept |
| Invariants | **Affect this element** **Inv-2**: evidence must have code or details (xpath: exists(f:code) or exists(f:details)) |
| **Condition.evidence.details** | |
| Definition | Links to other relevant information, including pathology reports |
| Control | 0..\* |
| Type | Resource(Any) |
| Invariants | **Affect this element** **Inv-2**: evidence must have code or details (xpath: exists(f:code) or exists(f:details)) |
| **Condition.location** | |
| Definition | The anatomical location where this condition manifests itself |
| Control | 0..\* |
| Comments | May be a summary code, or a reference to a very precise definition of the location, or both |
| Invariants | **Defined on this element** **Inv-3**: location must have code or details (xpath: exists(f:code) or exists(f:details)) |
| **Condition.location.code** | |
| Definition | Code that identifies the structural location |
| Control | 0..1 |
| Type | CodeableConcept |
| Comments | May include laterality |
| Invariants | **Affect this element** **Inv-3**: location must have code or details (xpath: exists(f:code) or exists(f:details)) |
| **Condition.location.details** | |
| Definition | Detailed anatomical location information |
| Control | 0..1 |
| Type | string |
| Invariants | **Affect this element** **Inv-3**: location must have code or details (xpath: exists(f:code) or exists(f:details)) |
| **Condition.relatedItem** | |
| Definition | Further conditions, problems, diagnoses, procedures or events that are related in some way to this condition, or the substance that caused/triggered this Condition |
| Control | 0..\* |
| Comments | Although a condition may be caused by a substance, this is not intended to be used to record allergies/adverse reactions to substances |
| Invariants | **Defined on this element** **Inv-4**: Relationship must have either a code or a target (xpath: exists(f:code) != exists(f:target)) |
| **Condition.relatedItem.type** | |
| Definition | The type of relationship that this condition has to the related item |
| Control | 1..1 |
| Binding | ConditionRelationshipType : The type of relationship between a condition and its related item (see [http://hl7.org/fhir/condition-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#condition-relationship-type) for values) |
| Type | code from ConditionRelationshipType |
| **Condition.relatedItem.code** | |
| Definition | Code that identifies the target of this relationship. The code takes the place of a detailed instance target |
| Control | 0..1 |
| Binding | ConditionFinding : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-condition-code)) |
| Type | CodeableConcept from ConditionFinding |
| Invariants | **Affect this element** **Inv-4**: Relationship must have either a code or a target (xpath: exists(f:code) != exists(f:target)) |
| **Condition.relatedItem.target** | |
| Definition | Target of the relationship |
| Control | 0..1 |
| Type | Resource(Condition|Procedure|Substance) |
| Invariants | **Affect this element** **Inv-4**: Relationship must have either a code or a target (xpath: exists(f:code) != exists(f:target)) |
| **Condition.notes** | |
| Definition | Additional information about the Condition. This is a general notes/comments entry for description of the Condition, its diagnosis and prognosis |
| Control | 0..1 |
| Type | string |
| To Do | Definition needs checking |

## 5.11: Resource Formal Definitions: Conformance

The formal definitions for the [Conformance (§3.6)](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance) resource.

|  |  |
| --- | --- |
| **Conformance** | |
| Definition | A conformance statement about how an application or implementation supports FHIR or the set of requirements for a desired implementation |
| Control | 1..1 |
| Invariants | **Defined on this element** **Inv-1**: A Conformance profile must have at least one of rest, messaging or document (xpath: exists(f:rest) or exists(f:messaging) or exists(f:document)) **Inv-2**: Must have at least one of description, software, or implementation (xpath: count(f:software | f:implementation | f:description) > 0) |
| **Conformance.identifier** | |
| Definition | The identifier that is used to identify this conformance statement when it is referenced in a specification, model, design or an instance (should be globally unique OID, UUID, or URI) |
| Control | 0..1 |
| Type | string |
| Summary | true |
| **Conformance.version** | |
| Definition | The identifier that is used to identify this version of the conformance statement when it is referenced in a specification, model, design or instance. This is an arbitrary value managed by the profile author manually and the value should be a timestamp |
| Control | 0..1 |
| Type | string |
| Summary | true |
| Comments | There may be multiple resource versions of the conformance statement that have this same identifier |
| **Conformance.name** | |
| Definition | A free text natural language name identifying the conformance statement |
| Control | 0..1 |
| Type | string |
| Summary | true |
| Comments | Not expected to be globally unique |
| **Conformance.publisher** | |
| Definition | Name of Organization |
| Control | 1..1 |
| Type | string |
| Summary | true |
| **Conformance.telecom** | |
| Definition | Contacts for Organization relevant to this conformance statement. May be website, email, phone numbers, etc. |
| Control | 0..\* |
| Type | Contact |
| Summary | true |
| **Conformance.description** | |
| Definition | A free text natural language description of the conformance statement and its use. Typically, this is used when the profile describes a desired rather than an actual solution, for example as a formal expression of requirements as part of an RFP |
| Control | 0..1 |
| Type | string |
| Summary | true |
| Comments | This field can be used for things such as why the conformance statement was written, comments about its context etc. This does not need to be populated when the description is adequately implied by the software or implementation details |
| Invariants | **Affect this element** **Inv-2**: Must have at least one of description, software, or implementation (xpath: count(f:software | f:implementation | f:description) > 0) |
| **Conformance.status** | |
| Definition | The status of this conformance statement |
| Control | 0..1 |
| Binding | ConformanceStatementStatus : The status of this conformance statement (see [http://hl7.org/fhir/conformance-statement-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#conformance-statement-status) for values) |
| Type | code from ConformanceStatementStatus |
| Must Understand | true |
| Summary | true |
| Comments | This is not intended for use with actual conformance statements, but where conformance statements are used to describe possible or desired systems |
| **Conformance.experimental** | |
| Definition | This conformance statement was authored for testing purposes (or education/evaluation/marketing), and is not intended to be used for genuine usage |
| Control | 0..1 |
| Type | boolean |
| Summary | true |
| Comments | Allows filtering of conformance statements that are appropriate for use vs. not |
| **Conformance.date** | |
| Definition | Date that the conformance statement is published |
| Control | 1..1 |
| Type | dateTime |
| Summary | true |
| **Conformance.software** | |
| Definition | Describes the software that is covered by this conformance statement. Used when the profile describes the capabilities of a particular software version, independent of an installation. |
| Control | 0..1 |
| Summary | true |
| Invariants | **Affect this element** **Inv-2**: Must have at least one of description, software, or implementation (xpath: count(f:software | f:implementation | f:description) > 0) |
| **Conformance.software.name** | |
| Definition | Name software is known by |
| Control | 1..1 |
| Type | string |
| Summary | true |
| **Conformance.software.version** | |
| Definition | Version covered by this statement |
| Control | 0..1 |
| Type | string |
| Summary | true |
| Comments | If possible, version should be specified, as statements are likely to be different for different versions of software |
| **Conformance.software.releaseDate** | |
| Definition | Date this version of the software released |
| Control | 0..1 |
| Type | dateTime |
| Summary | true |
| **Conformance.implementation** | |
| Definition | Used when the statement describes the capabilities of a specific implementation instance - i.e. a particular installation, rather than the capabilities of a software program |
| Control | 0..1 |
| Summary | true |
| Invariants | **Affect this element** **Inv-2**: Must have at least one of description, software, or implementation (xpath: count(f:software | f:implementation | f:description) > 0) |
| **Conformance.implementation.description** | |
| Definition | Information about the specific installation that this conformance statement relates to |
| Control | 1..1 |
| Type | string |
| Summary | true |
| **Conformance.implementation.url** | |
| Definition | The base URL for the implementation. This forms the base for REST interfaces as well as the mailbox and document interfaces. |
| Control | 0..1 |
| Type | uri |
| Summary | true |
| **Conformance.fhirVersion** | |
| Definition | The version of the FHIR specification on which this conformance statement is based |
| Control | 1..1 |
| Type | id |
| Summary | true |
| **Conformance.acceptUnknown** | |
| Definition | Whether the application accepts unknown non-"must understand" elements as part of a resource. This does not include extensions, but genuine new additions to a resource |
| Control | 1..1 |
| Type | boolean |
| **Conformance.format** | |
| Definition | The formats supported by this implementation |
| Control | 1..\* |
| Binding | MimeType : see [BCP 13 (RFCs 2045, 2046, 2047, 4288, 4289 and 2049) (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) |
| Type | code from MimeType |
| Comments | "xml" or "json" are allowed, which describe the simple encodings described in the specification (and imply appropriate bundle support). Otherwise, mime types are legal here |
| **Conformance.rest** | |
| Definition | Defines the restful capabilities of the solution, if any |
| Control | 0..\* |
| Comments | Multiple repetitions allow definition of both client and server behaviors or possibly behaviors under different configuration settings (for software or requirements statements) |
| Invariants | **Affect this element** **Inv-1**: A Conformance profile must have at least one of rest, messaging or document (xpath: exists(f:rest) or exists(f:messaging) or exists(f:document)) |
| **Conformance.rest.mode** | |
| Definition | Identifies whether this portion of the statement is describing ability to initiate or receive restful operations |
| Control | 1..1 |
| Binding | RestfulConformanceMode : The mode of a restful conformance statement (see [http://hl7.org/fhir/restful-conformance-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-conformance-mode) for values) |
| Type | code from RestfulConformanceMode |
| **Conformance.rest.documentation** | |
| Definition | Provides documentation about the system's restful capabilities that apply across all applications, such as security |
| Control | 0..1 |
| Type | string |
| To Do | Do we need something more formal for security capabilities? |
| **Conformance.rest.security** | |
| Definition | Information about security of implementation |
| Control | 0..1 |
| **Conformance.rest.security.service** | |
| Definition | What type of security services are supported/required |
| Control | 0..\* |
| Binding | RestfulSecurityService : Types of security services used with FHIR (see [http://hl7.org/fhir/restful-security-service](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-security-service) for values) |
| Type | CodeableConcept from RestfulSecurityService |
| **Conformance.rest.security.description** | |
| Definition | General description of how security works |
| Control | 0..1 |
| Type | string |
| **Conformance.rest.security.certificate** | |
| Definition | Certificates associated with security profiles |
| Control | 0..\* |
| **Conformance.rest.security.certificate.type** | |
| Definition | Mime type for certificate |
| Control | 0..1 |
| Binding | MimeType : see [BCP 13 (RFCs 2045, 2046, 2047, 4288, 4289 and 2049) (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) |
| Type | code from MimeType |
| **Conformance.rest.security.certificate.blob** | |
| Definition | Actual certificate |
| Control | 0..1 |
| Type | base64Binary |
| **Conformance.rest.resource** | |
| Definition | Identifies the restful capabilities of the solution for a specific resource type |
| Control | 1..\* |
| Comments | Max of one repetition per resource type |
| **Conformance.rest.resource.type** | |
| Definition | Identifies the resource exposed via the restful interface |
| Control | 1..1 |
| Binding | ResourceType : [Any defined Resource Type name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) |
| Type | code from ResourceType |
| **Conformance.rest.resource.profile** | |
| Definition | Identifies the profile that describes the solution's support for the resource, including any constraints on cardinality, bindings, lengths or other limitations |
| Control | 0..1 |
| Type | Resource(Profile) |
| Comments | This profile applies to all the resources of this type - i.e. it is the superset of what is supported |
| To Do | Does a system need to be able to enumerate profiles that it doe support? |
| **Conformance.rest.resource.operation** | |
| Definition | Identifies a restful operation supported by the solution |
| Control | 1..\* |
| Comments | The 'search' operation is handled separately |
| **Conformance.rest.resource.operation.code** | |
| Definition | Identifies which operation is supported |
| Control | 1..1 |
| Binding | RestfulOperation : Operations supported by REST (see [http://hl7.org/fhir/restful-operation](http://hl7.org/implement/standards/fhir/fhir-book.htm#restful-operation) for values) |
| Type | code from RestfulOperation |
| **Conformance.rest.resource.operation.documentation** | |
| Definition | Provides guidance specific to the implementation of this operation, such as 'delete is a logical delete' or 'updates are only allowed with version id' or 'creates permitted from pre-authorized certificates only' |
| Control | 0..1 |
| Type | string |
| Requirements | REST allows a degree of variability in the implementation of RESTful solutions that is useful for exchange partners to be aware of. |
| **Conformance.rest.resource.readHistory** | |
| Definition | A flag for whether the server is able to return past versions as part of the vRead operation |
| Control | 0..1 |
| Type | boolean |
| Comments | It is useful to support the vRead operation for current operations, even if past versions aren't available |
| **Conformance.rest.resource.searchInclude** | |
| Definition | \_include values supported by the server |
| Control | 0..\* |
| Type | string |
| Comments | If this list is empty, the server does not support includes |
| **Conformance.rest.resource.searchParam** | |
| Definition | Defines additional search parameters for implementations to support and/or make use of |
| Control | 0..\* |
| **Conformance.rest.resource.searchParam.name** | |
| Definition | Corresponds to the name of the standard or custom search parameter |
| Control | 1..1 |
| Type | string |
| Comments | Parameter names cannot overlap with standard parameter names, and standard parameters cannot be redefined |
| **Conformance.rest.resource.searchParam.source** | |
| Definition | A formal reference to where this parameter was first defined, so that a client can be confident of the meaning of the search parameter |
| Control | 0..1 |
| Type | uri |
| Comments | This SHOULD be populated for all search parameters not defined as custom search extensions. The uri for a search parameter defined in the specification itself is http://hl7.org/fhir/[resource]/search#[name] |
| **Conformance.rest.resource.searchParam.type** | |
| Definition | The type of value a search parameter refers to, and how the content is interpreted |
| Control | 1..1 |
| Binding | SearchParamType : Data types allowed to be used for search parameters (see [http://hl7.org/fhir/search-param-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type) for values) |
| Type | code from SearchParamType |
| **Conformance.rest.resource.searchParam.documentation** | |
| Definition | For standard parameters, provides additional information on how the parameter is used in this solution. For custom parameters, provides a description of what the parameter does |
| Control | 1..1 |
| Type | string |
| **Conformance.rest.resource.searchParam.target** | |
| Definition | Types of resource (if a resource reference) |
| Control | 0..\* |
| Binding | ResourceType : [Any defined Resource Type name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) |
| Type | code from ResourceType |
| **Conformance.rest.resource.searchParam.chain** | |
| Definition | Chained names supported |
| Control | 0..\* |
| Type | string |
| **Conformance.rest.batch** | |
| Definition | If batches are supported |
| Control | 0..1 |
| Type | boolean |
| **Conformance.rest.history** | |
| Definition | If a system wide history list is supported |
| Control | 0..1 |
| Type | boolean |
| **Conformance.messaging** | |
| Definition | Describes the messaging capabilities of the solution |
| Control | 0..\* |
| Comments | Multiple repetitions allow the documentation of multiple endpoints per solution |
| Invariants | **Defined on this element** **Inv-3**: Messaging end point is required (and is only permitted) when statement is for an implementation (xpath: exists(f:endpoint) = exists(parent::f:Conformance/f:implementation))**Affect this element** **Inv-1**: A Conformance profile must have at least one of rest, messaging or document (xpath: exists(f:rest) or exists(f:messaging) or exists(f:document)) |
| **Conformance.messaging.endpoint** | |
| Definition | The address to which messages and/or replies are to be sent. |
| Control | 0..1 |
| Type | uri |
| Comments | Can be just an identifier for solutions that do not use network addresses for routing. |
| Invariants | **Affect this element** **Inv-3**: Messaging end point is required (and is only permitted) when statement is for an implementation (xpath: exists(f:endpoint) = exists(parent::f:Conformance/f:implementation)) |
| **Conformance.messaging.reliableCache** | |
| Definition | The length if the receiver's reliable messaging cache length (if a receiver) or how long the cache length on the receiver should be (if a sender) |
| Control | 0..1 |
| Type | integer |
| **Conformance.messaging.documentation** | |
| Definition | Provides documentation about the system's messaging capabilities for this endpoint not otherwise documented by the conformance statement. For example, process for becoming an authorized messaging exchange partner. |
| Control | 0..1 |
| Type | string |
| Comments | If this value is missing then the application does not implement (receiver) or depend on (sender) reliable messaging |
| **Conformance.messaging.event** | |
| Definition | Describes the solution's support for an event at this end point. |
| Control | 1..\* |
| Comments | The same event may be listed up to two times - once as sender and once as receiver. |
| To Do | Need to add follow-ups and need to do more to flesh out messaging dynamic model |
| **Conformance.messaging.event.code** | |
| Definition | Identifies the supported messaging event |
| Control | 1..1 |
| Binding | MessageEvent : the [Event List in the messaging framework (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-events) |
| Type | code from MessageEvent |
| To Do | May need profile id as well if profiles can define message events |
| **Conformance.messaging.event.mode** | |
| Definition | The mode of this event declaration - whether application is sender or receiver |
| Control | 1..1 |
| Binding | ConformanceEventMode : The mode of a message conformance statement (see [http://hl7.org/fhir/message-conformance-event-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-conformance-event-mode) for values) |
| Type | code from ConformanceEventMode |
| **Conformance.messaging.event.protocol** | |
| Definition | Identifies the messaging transport protocol(s) supported by this endpoint |
| Control | 0..\* |
| Binding | MessageTransport : How messages are delivered (see [http://hl7.org/fhir/message-transport](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-transport) for values) |
| Type | Coding from MessageTransport |
| To Do | Loosen this to "extensible" once tooling supports that. |
| **Conformance.messaging.event.focus** | |
| Definition | Identifies the resource associated with the event. This is the resource that defines the event. |
| Control | 1..1 |
| Binding | ResourceType : [Any defined Resource Type name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-types) |
| Type | code from ResourceType |
| Comments | This must be provided if the event type supports multiple different resource types |
| **Conformance.messaging.event.request** | |
| Definition | Information about the request for this event |
| Control | 1..1 |
| Type | Resource(Profile) |
| **Conformance.messaging.event.response** | |
| Definition | Information about the response for this event |
| Control | 1..1 |
| Type | Resource(Profile) |
| **Conformance.messaging.event.documentation** | |
| Definition | Guidance on how this event is handled, such as internal system trigger points, business rules, etc. |
| Control | 0..1 |
| Type | string |
| **Conformance.document** | |
| Definition | A document definition |
| Control | 0..\* |
| Invariants | **Affect this element** **Inv-1**: A Conformance profile must have at least one of rest, messaging or document (xpath: exists(f:rest) or exists(f:messaging) or exists(f:document)) |
| **Conformance.document.mode** | |
| Definition | The mode of this event declaration - whether application is sender or receiver |
| Control | 1..1 |
| Binding | DocumentMode : Whether the application produces or consumes documents (see [http://hl7.org/fhir/document-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-mode) for values) |
| Type | code from DocumentMode |
| **Conformance.document.documentation** | |
| Definition | Describes how the application supports or uses the specified document profile. For example, when are documents created, what action is taken with consumed documents, etc. |
| Control | 0..1 |
| Type | string |
| **Conformance.document.profile** | |
| Definition | Constraint on a resource used in the document |
| Control | 1..1 |
| Type | Resource(Profile) |
| Comments | The first resource is the document resource |

## 5.12: Resource Formal Definitions: Coverage

The formal definitions for the [Coverage (§3.7)](http://hl7.org/implement/standards/fhir/fhir-book.htm#coverage) resource.

|  |  |
| --- | --- |
| **Coverage** | |
| Definition | Financial instrument by which payment information for health care |
| Control | 1..1 |
| Requirements | Health care programs and insurers are significant payors of health service costs |
| **Coverage.issuer** | |
| Definition | The program or plan underwriter or payor. |
| Control | 0..1 |
| Type | Resource(Organization) |
| Requirements | Need to identify the issuer to target for processing and for coordination of benefit processing. |
| **Coverage.period** | |
| Definition | Time period during which the coverage is in force. A missing start date indicates the start date isn't known, a missing end date means the coverage is continuing to be in force. |
| Control | 0..1 |
| Type | Period |
| **Coverage.type** | |
| Definition | The type of coverage: social program, medical plan, accident coverage (workers compensation, auto), group health. |
| Control | 1..1 |
| Binding | CoverageType : The type of insurance: public health, worker compensation; private accident, auto, private health, etc.) ([Value Set Definition (http://hl7.org/fhirv3/ActCoverageTypeCode/index.htm)](http://hl7.org/fhirv3/ActCoverageTypeCode/index.htm) ) |
| Type | Coding from CoverageType |
| Requirements | The order of application of coverages is dependent on the types of coverage. |
| **Coverage.identifier** | |
| Definition | The main (and possibly only) identifier for the coverage - often referred to as a Subscriber Id, Certificate number or Personal Health Number or Case ID. |
| Control | 0..1 |
| Type | Identifier |
| Requirements | This value may uniquely identify the coverage or it may be used in conjunction with the additional identifiers below. |
| **Coverage.group** | |
| Definition | Todo |
| Control | 0..1 |
| Type | Identifier |
| **Coverage.plan** | |
| Definition | Identifies a style or collective of coverage issues by the underwriter, for example may be used to identify a class of coverage or employer group. May also be referred to as a Policy or Group ID. |
| Control | 0..1 |
| Type | Identifier |
| **Coverage.subplan** | |
| Definition | Identifies a sub-style or sub-collective of coverage issues by the underwriter, for example may be used to identify a specific employer group within a class of employers. May be referred to as a Section or Division ID. |
| Control | 0..1 |
| Type | Identifier |
| **Coverage.dependent** | |
| Definition | A unique identifier for a dependent under the coverage. |
| Control | 0..1 |
| Type | integer |
| Requirements | For some coverage a single identifier is issued to the PolicyHolder and dependent number issues to each to each of their dependents to track and manage the plan. |
| **Coverage.sequence** | |
| Definition | An optional counter for a particular instance of the identified coverage which increments upon each renewal. |
| Control | 0..1 |
| Type | integer |
| Requirements | Some coverage, for example social plans, may be offered in short time increments, for example for a week or a month at a time, so while the rest of the plan details and identifiers may remain constant over time, the instance is incremented with each renewal and provided to the covered party on their 'card'. |
| **Coverage.subscriber** | |
| Definition | Planholder information |
| Control | 0..1 |
| **Coverage.subscriber.name** | |
| Definition | The name of the PolicyHolder |
| Control | 0..1 |
| Type | HumanName |
| Requirements | Used to validate coverage |
| **Coverage.subscriber.address** | |
| Definition | The mailing address, typically home, of the PolicyHolder |
| Control | 0..1 |
| Type | Address |
| **Coverage.subscriber.birthdate** | |
| Definition | The date of birth of the PolicyHolder |
| Control | 0..1 |
| Type | date |
| Requirements | Used to validate coverage |

## 5.13: Resource Formal Definitions: Device

The formal definitions for the [Device (§3.8)](http://hl7.org/implement/standards/fhir/fhir-book.htm#device) resource.

|  |  |
| --- | --- |
| **Device** | |
| Definition | This resource identifies an instance of a manufactured thing that is used in the provision of healthcare without being substantially changed through that activity. The device may be a machine, an insert, a computer, an application, etc. This includes durable (reusable) medical equipment as well as disposable equipment used for diagnostic, treatment, and research for healthcare and public health. |
| Control | 1..1 |
| Requirements | Allows institutions to track their devices. |
| **Device.type** | |
| Definition | Describes what kind of device that this |
| Control | 1..1 |
| Binding | DeviceKind : Defines the nature of the device and the kind of functionality/services/behavior that may be expected from it |
| Type | CodeableConcept from DeviceKind |
| **Device.manufacturer** | |
| Definition | The name of the manufacturer |
| Control | 0..1 |
| Type | string |
| **Device.model** | |
| Definition | The "model" - an identifier assigned by the manufacturer to identify the product by its type. This number is shared by the all devices sold as the same type |
| Control | 0..1 |
| Type | string |
| **Device.version** | |
| Definition | The version of the device, if the device has multiple releases under the same model, or if the device is software or carries firmware |
| Control | 0..1 |
| Type | string |
| **Device.expiry** | |
| Definition | Date of expiry of this device (if applicable) |
| Control | 0..1 |
| Type | date |
| **Device.identity** | |
| Definition | Universal Device Id fields |
| Control | 0..1 |
| Requirements | In order to carry UDI (US regulations, but being adopted across the world) |
| **Device.identity.gtin** | |
| Definition | The number assigned to this device by an authorised issuer of Device GTINs, based on the standards set by GS1 |
| Control | 0..1 |
| Type | string |
| Comments | This is a 14 digit number that may include leading 0s |
| **Device.identity.lot** | |
| Definition | Lot number of manufacture |
| Control | 0..1 |
| Type | string |
| Comments | Alphanumeric Maximum 20 |
| **Device.identity.serialNumber** | |
| Definition | The serial number assigned by the organisation when the device was manufactured |
| Control | 1..1 |
| Type | string |
| Comments | Alphanumeric Maximum 20 |
| **Device.owner** | |
| Definition | The organization that is responsible for the provision and ongoing maintenance of the device |
| Control | 0..1 |
| Type | Resource(Organization) |
| **Device.assignedId** | |
| Definition | Identifiers assigned to this device by various organizations (unless other specific fields exist for them) |
| Control | 0..\* |
| Type | Identifier |
| Comments | Often fixed to the device as a barcode. May include names given to the device in local usage |
| **Device.location** | |
| Definition | The resource may be found in a literal location (i.e. GPS coordinates), a logical place (i.e. "in/with the patient"), or a coded location |
| Control | 0..1 |
| Type | Resource(Location) |
| **Device.patient** | |
| Definition | If the resource is affixed to a person |
| Control | 0..1 |
| Type | Resource(Patient) |
| **Device.contact** | |
| Definition | Contact details for an organization or a particular human that is responsible for the device |
| Control | 0..\* |
| Type | Contact |
| Comments | used for troubleshooting etc. |
| **Device.url** | |
| Definition | A network address on which the device may be contacted directly |
| Control | 0..1 |
| Type | uri |
| Comments | if the device is running a FHIR server, the network address should be the root URL from which a conformance statement may be retrieved |

## 5.14: Resource Formal Definitions: DeviceCapabilities

The formal definitions for the [DeviceCapabilities (§3.9)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicecapabilities) resource.

|  |  |
| --- | --- |
| **DeviceCapabilities** | |
| Definition | Describes the set of data produced by a device |
| Control | 1..1 |
| Comments | This resource defines what the meanings of the key values are in a device log resource |
| **DeviceCapabilities.name** | |
| Definition | The name of this device |
| Control | 0..1 |
| Type | string |
| Comments | Not all devices have clocks, and so the time may not be included |
| **DeviceCapabilities.type** | |
| Definition | The kind of device - what kind of functionality it provides |
| Control | 0..1 |
| Binding | DeviceKind : Defines the nature of the device and the kind of functionality/services/behavior that may be expected from it |
| Type | CodeableConcept from DeviceKind |
| Comments | See Device.type (same codes) |
| **DeviceCapabilities.manufacturer** | |
| Definition | The company that built this device |
| Control | 0..1 |
| Type | string |
| **DeviceCapabilities.identity** | |
| Definition | Identifies this particular device uniquely |
| Control | 0..1 |
| Type | Resource(Device) |
| Comments | Some devices may be configured with identifying information |
| **DeviceCapabilities.virtualDevice** | |
| Definition | A medical-related subsystem of a medical device |
| Control | 0..\* |
| **DeviceCapabilities.virtualDevice.code** | |
| Definition | Describes the compartment |
| Control | 0..1 |
| Binding | DeviceCompartmentKind : Describes the compartment |
| Type | CodeableConcept from DeviceCompartmentKind |
| **DeviceCapabilities.virtualDevice.channel** | |
| Definition | Groups together physiological measurement data and derived data |
| Control | 0..\* |
| Comments | Usually, either a value or some flags should be provided |
| **DeviceCapabilities.virtualDevice.channel.code** | |
| Definition | Describes the channel |
| Control | 0..1 |
| Binding | DeviceChannelKind : Describes the channel |
| Type | CodeableConcept from DeviceChannelKind |
| **DeviceCapabilities.virtualDevice.channel.metric** | |
| Definition | A piece of measured or derived data that will be reported by the machine |
| Control | 0..\* |
| Comments | Usually, either a value or some flags should be provided |
| **DeviceCapabilities.virtualDevice.channel.metric.code** | |
| Definition | Describes the metrics |
| Control | 1..1 |
| Binding | DeviceMetricsCode : Describes the metrics |
| Type | CodeableConcept from DeviceMetricsCode |
| **DeviceCapabilities.virtualDevice.channel.metric.key** | |
| Definition | Used to link to data in device log |
| Control | 1..1 |
| Type | string |
| Comments | Usually, either a value or some flags should be provided |
| **DeviceCapabilities.virtualDevice.channel.metric.info** | |
| Definition | How to interpret this metric value |
| Control | 1..1 |
| Invariants | **Defined on this element** **Inv-1**: If the type is "Quantity", units must be provided (xpath: ((f:type/@value = 'Quantity') and (f:units)) or (not (f:type/@value != 'Quantity') and not (f:units))) **Inv-2**: If the type is "Coding', system must be provided (xpath: (f:type/@value != 'Coding') or f:system) **Inv-3**: If the type is "Quantity", ucum must be provided (xpath: ((f:type/@value = 'Quantity') and (f:ucum)) or ((f:type/@value != 'Quantity') and not (f:ucum))) **Inv-4**: If the type is "SampledData", an sampling template must be provided (xpath: ((f:type/@value = 'SampledData') and (f:template)) or ((f:type/@value != 'SampledData') and not (f:template))) |
| **DeviceCapabilities.virtualDevice.channel.metric.info.type** | |
| Definition | Type of data for this metric |
| Control | 1..1 |
| Binding | DeviceDataType : The type of data produced by a device (see [http://hl7.org/fhir/device-data-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-data-type) for values) |
| Type | code from DeviceDataType |
| Invariants | **Affect this element** **Inv-1**: If the type is "Quantity", units must be provided (xpath: ((f:type/@value = 'Quantity') and (f:units)) or (not (f:type/@value != 'Quantity') and not (f:units))) |
| **DeviceCapabilities.virtualDevice.channel.metric.info.units** | |
| Definition | Units for this data item (if a quantity or a range) |
| Control | 0..1 |
| Type | string |
| Invariants | **Affect this element** **Inv-1**: If the type is "Quantity", units must be provided (xpath: ((f:type/@value = 'Quantity') and (f:units)) or (not (f:type/@value != 'Quantity') and not (f:units))) |
| **DeviceCapabilities.virtualDevice.channel.metric.info.ucum** | |
| Definition | UCUM units (if a quantity or a range) |
| Control | 0..1 |
| Binding | UCUM : see [http://unitsofmeasure.org](http://unitsofmeasure.org/) |
| Type | code from UCUM |
| Comments | Although UCUM units are not required, they are strongly encouraged |
| Invariants | **Affect this element** **Inv-3**: If the type is "Quantity", ucum must be provided (xpath: ((f:type/@value = 'Quantity') and (f:ucum)) or ((f:type/@value != 'Quantity') and not (f:ucum))) |
| **DeviceCapabilities.virtualDevice.channel.metric.info.template** | |
| Definition | A template containing the fixed values for an array output (all the values but the data) |
| Control | 0..1 |
| Type | SampledData |
| Invariants | **Affect this element** **Inv-4**: If the type is "SampledData", an sampling template must be provided (xpath: ((f:type/@value = 'SampledData') and (f:template)) or ((f:type/@value != 'SampledData') and not (f:template))) |
| **DeviceCapabilities.virtualDevice.channel.metric.info.system** | |
| Definition | System of the codes, if the type is a Coding |
| Control | 0..1 |
| Type | uri |
| Invariants | **Affect this element** **Inv-2**: If the type is "Coding', system must be provided (xpath: (f:type/@value != 'Coding') or f:system) |
| **DeviceCapabilities.virtualDevice.channel.metric.facet** | |
| Definition | Additional data that qualifies the metric, or contributes to its assessment |
| Control | 0..\* |
| **DeviceCapabilities.virtualDevice.channel.metric.facet.code** | |
| Definition | Describes the facet |
| Control | 1..1 |
| Binding | DeviceFacetCode : see [http://loinc.org](http://loinc.org/) |
| Type | CodeableConcept from DeviceFacetCode |
| **DeviceCapabilities.virtualDevice.channel.metric.facet.scale** | |
| Definition | The factor to apply to the raw values to get the correct value |
| Control | 0..1 |
| Type | decimal |
| Comments | The default value is 1 |
| **DeviceCapabilities.virtualDevice.channel.metric.facet.key** | |
| Definition | Used to link to data in device log |
| Control | 1..1 |
| Type | string |
| **DeviceCapabilities.virtualDevice.channel.metric.facet.info** | |
| Definition | How to interpret this facet value |
| Control | 1..1 |
| Type | @DeviceCapabilities.virtualDevice.channel.metric.info |

## 5.15: Resource Formal Definitions: DeviceLog

The formal definitions for the [DeviceLog (§3.10)](http://hl7.org/implement/standards/fhir/fhir-book.htm#devicelog) resource.

|  |  |
| --- | --- |
| **DeviceLog** | |
| Definition | A set of raw data produced by a device |
| Control | 1..1 |
| Requirements | A low level ultra-simple resource is needed to devices that send current observations on a routine bases as an event log |
| Comments | This resource can only be understood in the context of the DeviceCapabilities that defines what the meanings of the key values are |
| **DeviceLog.instant** | |
| Definition | The point in time that the values are reported |
| Control | 0..1 |
| Type | instant |
| Comments | Not all devices have clocks, and so the time may not be included |
| **DeviceLog.capabilities** | |
| Definition | An explicit reference to the capabilities |
| Control | 0..1 |
| Type | Resource(DeviceCapabilities) |
| Comments | Simple devices may not be in a position to provide an explicit capabilities reference (though even the simplest devices could refer to a capabilities resource on a manufacturer website) |
| **DeviceLog.subject** | |
| Definition | The subject of the measurement |
| Control | 0..1 |
| Type | Resource(Patient|Group|Device) |
| Comments | Devices may hold no information about the subject at all, or possibly just an id read from a bar code, with no additional knowledge |
| **DeviceLog.item** | |
| Definition | An item of data that the device produces |
| Control | 0..\* |
| **DeviceLog.item.key** | |
| Definition | Reference to a device capabilities declaration |
| Control | 1..1 |
| Type | string |
| **DeviceLog.item.value** | |
| Definition | The value of the data item, if available. Irrespective of the logical format of the data item, the value is always represented as a string |
| Control | 0..1 |
| Type | string |
| Comments | Usually, either a value or some flags should be provided |
| **DeviceLog.item.flag** | |
| Definition | Information about the quality of the data etc. |
| Control | 0..\* |
| Binding | DeviceValueFlag : Flags that supply information about the status of a device reading (see [http://hl7.org/fhir/device-value-flag](http://hl7.org/implement/standards/fhir/fhir-book.htm#device-value-flag) for values) |
| Type | code from DeviceValueFlag |
| Must Understand | true |
| Comments | Usually, either a value or some flags should be provided |

## 5.16: Resource Formal Definitions: DeviceObservation

The formal definitions for the [DeviceObservation (§3.11)](http://hl7.org/implement/standards/fhir/fhir-book.htm#deviceobservation) resource.

|  |  |
| --- | --- |
| **DeviceObservation** | |
| Definition | A set of observations produced by a device |
| Control | 1..1 |
| **DeviceObservation.code** | |
| Definition | A code that identifies what type of device observation this is |
| Control | 1..1 |
| Type | CodeableConcept |
| **DeviceObservation.identifier** | |
| Definition | Identifiers assigned to this observation |
| Control | 0..\* |
| Type | Identifier |
| **DeviceObservation.issued** | |
| Definition | Date the measurements were made |
| Control | 1..1 |
| Type | instant |
| Requirements | Clinicians need to be able to check the date that the report was released |
| Aliases | Date Created; Date published; Date Issued |
| Comments | In this context, it is assumed that the issued date is the date that the observations were actually made |
| **DeviceObservation.subject** | |
| Definition | The subject of the measurements. Usually, but not always, this is a patient. However devices are also used to make measurements on other things as well |
| Control | 1..1 |
| Type | Resource(Patient|Group|Device) |
| Requirements | Must know the subject context |
| Aliases | Patient |
| **DeviceObservation.device** | |
| Definition | Device that produced the results |
| Control | 1..1 |
| Type | Resource(Device) |
| Requirements | Need to be able to trace the source of the measurements |
| Aliases | Source; performer |
| **DeviceObservation.measurement** | |
| Definition | The actual measurements that the device produced |
| Control | 0..\* |
| Type | Resource(Observation) |

## 5.17: Resource Formal Definitions: DiagnosticOrder

The formal definitions for the [DiagnosticOrder (§3.12)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticorder) resource.

|  |  |
| --- | --- |
| **DiagnosticOrder** | |
| Definition | A request for a diagnostic investigation service to be performed |
| Control | 1..1 |
| Aliases | Report; Test; Result; Results; Labs; Laboratory |
| **DiagnosticOrder.subject** | |
| Definition | Who or what the investigation is to be performed on. This is usually a human patient, but diagnostic tests can also be requested on animals, groups of humans or animals, devices such as dialysis machines, or even locations (typically for environmental scans) |
| Control | 1..1 |
| Type | Resource(Patient|Group|Location|Device) |
| **DiagnosticOrder.orderer** | |
| Definition | The practitioner that holds legal responsibility for ordering the investigation |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| **DiagnosticOrder.identifier** | |
| Definition | Identifiers assigned to this order by the order or by the receiver |
| Control | 0..\* |
| Type | Identifier |
| **DiagnosticOrder.encounter** | |
| Definition | A encounter that provides additional information about the healthcare context in which this request is made |
| Control | 0..1 |
| Type | Resource(Encounter) |
| **DiagnosticOrder.clinicalNotes** | |
| Definition | An explanation or justification for why this diagnostic investigation is being requested |
| Control | 0..1 |
| Type | string |
| Comments | This may be used to decide how the diagnostic investigation will be performed, or even if it will be performed at all |
| **DiagnosticOrder.specimen** | |
| Definition | One or more specimens that the diagnostic investigation is about |
| Control | 0..\* |
| Type | Resource(Specimen) |
| Comments | Many investigation requests will create a need for specimens, but the request itself is not actually about the specimens. This is provided for when the diagnostic investigation is requested on already existing specimens |
| **DiagnosticOrder.status** | |
| Definition | The status of the order |
| Control | 0..1 |
| Binding | DiagnosticOrderStatus : The status of a diagnostic order (see [http://hl7.org/fhir/diagnostic-order-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) for values) |
| Type | code from DiagnosticOrderStatus |
| Comments | Typically the system placing the order sets the status to requested. Thereafter, the order is maintained by the receiver that updates the status as the request is handled |
| **DiagnosticOrder.event** | |
| Definition | A summary of the events of interest that have occurred as the request is processed |
| Control | 0..\* |
| Comments | This is not the same as an audit trail - it is a view of the important things that happened in the past. Typically, there would only be one entry for any given status, and systems may not record all the status events |
| **DiagnosticOrder.event.status** | |
| Definition | The status for the event |
| Control | 1..1 |
| Binding | DiagnosticOrderStatus : The status of a diagnostic order (see [http://hl7.org/fhir/diagnostic-order-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) for values) |
| Type | code from DiagnosticOrderStatus |
| **DiagnosticOrder.event.date** | |
| Definition | The date/time at which the event occurred |
| Control | 1..1 |
| Type | dateTime |
| **DiagnosticOrder.event.actor** | |
| Definition | The person who was responsible for performing or recording the action |
| Control | 0..1 |
| Type | Resource(Practitioner|Device) |
| **DiagnosticOrder.item** | |
| Definition | The specific diagnostic investigations that are requested as part of this request. Sometimes, there can only be one item per request, but in most contexts, more than one investigation can be requested |
| Control | 0..\* |
| Comments | There would always be at least one item in normal usage, but this is optional so that a workflow can quote order details without having to list the items |
| **DiagnosticOrder.item.code** | |
| Definition | A code that identifies a particular diagnostic investigation that has been requested |
| Control | 1..1 |
| Binding | DiagnosticRequests : LOINC Order Codes ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-requests)) |
| Type | CodeableConcept from DiagnosticRequests |
| **DiagnosticOrder.item.specimen** | |
| Definition | If the item is related to a specific specimen |
| Control | 0..\* |
| Type | Resource(Specimen) |
| Comments | A single specimen should not appear in both DiagnosticOrder.specimen and DiagnosticOrder.item.specimen |
| **DiagnosticOrder.item.bodySite** | |
| Definition | Anatomical location where the request test should be performed |
| Control | 0..1 |
| Binding | BodySite : SNOMED-CT Body site concepts ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site)) |
| Type | CodeableConcept from BodySite |
| Aliases | location |
| **DiagnosticOrder.item.status** | |
| Definition | The status of this individual item within the order |
| Control | 0..1 |
| Binding | DiagnosticOrderStatus : The status of a diagnostic order (see [http://hl7.org/fhir/diagnostic-order-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnostic-order-status) for values) |
| Type | code from DiagnosticOrderStatus |
| Comments | If the request has multiple items that have their own life cycles, then the items will have their own status while the overall diagnostic order is (usually) "in progress" |
| **DiagnosticOrder.item.event** | |
| Definition | A summary of the events of interest that have occurred as this item of the request is processed |
| Control | 0..\* |
| Type | @DiagnosticOrder.event |

## 5.18: Resource Formal Definitions: DiagnosticReport

The formal definitions for the [DiagnosticReport (§3.13)](http://hl7.org/implement/standards/fhir/fhir-book.htm#diagnosticreport) resource.

|  |  |
| --- | --- |
| **DiagnosticReport** | |
| Definition | The findings and interpretation of diagnostic tests performed on patients and/or specimens. The report includes clinical context such as requesting and provider information, and some mix of atomic results, images, textual and coded interpretation, and formatted representation of diagnostic reports |
| Control | 1..1 |
| Requirements | To support reporting for any diagnostic report into a clinical data repository. |
| Aliases | Report; Test; Result; Results; Labs; Laboratory |
| Comments | This is intended to capture a single report, and is not suitable for use in displaying summary information that covers multiple reports. A typical example is a laboratory cumulative report format |
| **DiagnosticReport.status** | |
| Definition | The status of the diagnostic report as a whole |
| Control | 1..1 |
| Binding | ObservationStatus : Codes providing the status of an observation (see [http://hl7.org/fhir/observation-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) for values) |
| Type | code from ObservationStatus |
| Must Understand | true |
| Requirements | Diagnostic services routinely issue provisional/incomplete reports, and sometimes withdraw previously released reports. |
| Summary | true |
| Comments | This is labelled as "Is Modifier" because applications need to take appropriate action if a report is withdrawn |
| **DiagnosticReport.issued** | |
| Definition | The date and/or time that this version of the report was released from the source diagnostic service |
| Control | 1..1 |
| Type | dateTime |
| Requirements | Clinicians need to be able to check the date that the report was released |
| Aliases | Date Created; Date published; Date Issued |
| Summary | true |
| Comments | May be different from the update time of the resource itself, because that is the status of the record (potentially a secondary copy), not the actual release time of the report |
| **DiagnosticReport.subject** | |
| Definition | The subject of the report. Usually, but not always, this is a patient. However diagnostic services also perform analyses on specimens collected from a variety of other sources |
| Control | 1..1 |
| Type | Resource(Patient|Group|Device) |
| Requirements | Must know the subject context |
| Aliases | Patient |
| Summary | true |
| **DiagnosticReport.performer** | |
| Definition | The diagnostic service that is responsible for issuing the report |
| Control | 1..1 |
| Type | Resource(Organization) |
| Requirements | Need to know who to contact if there are queries about the results. Also may need to track the source of reports for secondary data analysis |
| Aliases | Laboratory; Service; Practitioner; Department; Company |
| Summary | true |
| Comments | This is not necessarily the source of the atomic data items - it's the entity that takes responsibility for the clinical report |
| **DiagnosticReport.reportId** | |
| Definition | The local ID assigned to the report by the order filler, usually by the Information System of the diagnostic service provider |
| Control | 0..1 |
| Type | Identifier |
| Requirements | Need to know what identifier to use when making queries about this report from the source laboratory, and for linking to the report outside FHIR context |
| Aliases | Identifier |
| Summary | true |
| **DiagnosticReport.requestDetail** | |
| Definition | Details concerning a single pathology test requested. |
| Control | 0..\* |
| Requirements | Need to be able to track completion of requests based on reports issued and also to report what diagnostic tests were requested (not always the same as what is delivered) |
| Comments | Note: Usually there is one test request for each result, however in some circumstances multiple test requests may be represented using a single Pathology test result resource. Note that there are also cases where one request leads to multiple reports |
| **DiagnosticReport.requestDetail.encounter** | |
| Definition | The encounter that this diagnostic investigation is associated with |
| Control | 0..1 |
| Type | Resource(Encounter) |
| Requirements | Some institutions track and file diagnostic reports under a specific encounter |
| Aliases | Episode; Admission |
| To Do | Question whether this is 80% |
| **DiagnosticReport.requestDetail.requestOrderId** | |
| Definition | The local ID assigned to the order by the order requester. |
| Control | 0..1 |
| Type | Identifier |
| Requirements | Need to be able to track completion of requests based on reports issued |
| Aliases | Placer Order Identifier |
| Comments | Equivalent to the Placer Order Identifier |
| To Do | Reckon this is not 80% |
| **DiagnosticReport.requestDetail.receiverOrderId** | |
| Definition | The local ID assigned to the test order by the diagnostic service provider |
| Control | 0..1 |
| Type | Identifier |
| Requirements | Need to be able to track completion of requests based on reports issued |
| Aliases | Filler Order Identifier |
| Comments | Usually equivalent to the DICOM Accession Number and the Filler Order Identifier. |
| To Do | Reckon this is not 80% |
| **DiagnosticReport.requestDetail.requestTest** | |
| Definition | Identification of pathology test requested, |
| Control | 0..\* |
| Binding | DiagnosticRequests : LOINC Order Codes ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-requests)) |
| Type | CodeableConcept from DiagnosticRequests |
| Requirements | Need to be able to report what diagnostic tests were requested (not always the same as what is delivered) |
| Aliases | Test; request |
| Comments | Useful where the test requested differs from the test actually performed. |
| **DiagnosticReport.requestDetail.bodySite** | |
| Definition | Anatomical location where the request test should be performed |
| Control | 0..1 |
| Binding | BodySite : SNOMED-CT Body site concepts ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site)) |
| Type | CodeableConcept from BodySite |
| Aliases | location |
| Comments | This is often implicit or explicit in the requested test, and doesn't need to be specified if so |
| **DiagnosticReport.requestDetail.requester** | |
| Definition | Details of the clinician or organisation requesting the diagnostic service |
| Control | 0..1 |
| Type | Resource(Organization|Practitioner) |
| Requirements | The requesting clinician may need to be contacted concerning the method or interpretation of the diagnostic service, and is frequently used for billing purposes too |
| Aliases | Practitioner; Orderer; Physician |
| **DiagnosticReport.requestDetail.clinicalInfo** | |
| Definition | Details of the clinical information provided to the diagnostic service along with the original request |
| Control | 0..1 |
| Type | string |
| Requirements | Knowing the clinical information may influence the interpretation of the result |
| **DiagnosticReport.serviceCategory** | |
| Definition | The section of the diagnostic service that performs the examination e.g. biochemistry, haematology, MRI |
| Control | 0..1 |
| Binding | DiagnosticServiceSection : HL7 v2 table 0074 ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-diagnostic-service-sections)) |
| Type | CodeableConcept from DiagnosticServiceSection |
| Requirements | Help clinicians filter/find the reports they are looking for |
| Aliases | Department; Sub-department; service; discipline |
| Summary | true |
| **DiagnosticReport.diagnosticTime** | |
| Definition | The diagnostically relevant time for this report |
| Control | 1..1 |
| Type | dateTime |
| Requirements | Need to know where in the patient history to file/present this report |
| Aliases | Observation time; Effective Time |
| Summary | true |
| Comments | If the diagnostic procedure was performed on the patient, this is the time it was performed. If there is specimens, the diagnostically relevant time can be derived from the specimen collection times, but the specimen information is not always available, and nor is the exact relationship is not always automatic |
| **DiagnosticReport.results** | |
| Definition | A group of results. Results may be grouped by specimen, or by some value in DiagnosticReport.resultGroup.name to describe what binds all the results together. |
| Control | 1..1 |
| Requirements | Need to be able to report groups of results, where the result grouping is arbitrary, but meaningful. This structure is recursive - groups can contain groups. The base group doesn't usually contain a group name, but nested groups always do |
| Aliases | Data |
| **DiagnosticReport.results.name** | |
| Definition | A code or name that describes this group of results. For the base group, this is the report name |
| Control | 1..1 |
| Binding | DiagnosticResultGroupNames : LOINC Codes for Diagnostic Reports ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-report-names)) |
| Type | CodeableConcept from DiagnosticResultGroupNames |
| Comments | Examples of nested report groups: the antibody code for a group of antibody related test, or the organism code for a group of isolate/sensitivities, or a set of perinatal measurements on a single fetus. |
| **DiagnosticReport.results.specimen** | |
| Definition | Details about the individual specimen to which these 'Result group' test results refer |
| Control | 0..1 |
| Type | Resource(Specimen) |
| Requirements | Need to be able to report information about the collected specimens on which the report is based |
| **DiagnosticReport.results.group** | |
| Definition | A sub-group in a report group. Sub groups can be grouped in arbitrary ways. The group.name defines the purpose and interpretation of the grouping |
| Control | 0..\* |
| Type | @DiagnosticReport.results |
| Aliases | Battery; Organiser |
| Comments | Nested report groups beyond the first level are not used often, but arise in structured pathology reports, and where there is more than one sensitivity assessment per discovered organism |
| **DiagnosticReport.results.result** | |
| Definition | Specific detailed result, including both the value of the result item and additional information that may be useful for clinical interpretation. Results include whatever specific data items pathology labs report as part of the clinical service; it is not confined to measurements. |
| Control | 0..\* |
| Type | Resource(Observation) |
| Requirements | Need to report results with information that assist with interpretation |
| Aliases | Atomic result; Data; Test; Analyte |
| **DiagnosticReport.image** | |
| Definition | A list of key images associated with this report. The images are generally created during the diagnostic process, and maybe directly of the patient, or of treated specimens (i.e. slides of interest) |
| Control | 0..\* |
| Type | Resource(Picture|ImagingStudy) |
| Aliases | Dicom; Slides; Scans |
| Comments | An imaging study is a list of images following a DICOM specification - only list one of these, or multiple images |
| **DiagnosticReport.conclusion** | |
| Definition | Concise and clinically contextualised narrative interpretation of the diagnostic report |
| Control | 0..1 |
| Type | string |
| Requirements | Need to be able to provide a conclusion that is not lost amongst the basic result data |
| Aliases | Report |
| Comments | Typically, a report is either [all data, no narrative (e.g. Core lab)] or [a mix of data with some concluding narrative (e.g. Structured Pathology Report, Bone Density)], or [all narrative (e.g. typical imaging report, histopathology)]. In all these cases, the narrative goes in "text" |
| **DiagnosticReport.codedDiagnosis** | |
| Definition | Codes for the conclusion |
| Control | 0..\* |
| Binding | DiagnosisCodes : SNOMED-CT Clinical Findings ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-clinical-findings)) |
| Type | CodeableConcept from DiagnosisCodes |
| **DiagnosticReport.representation** | |
| Definition | Rich text representation of the entire result as issued by the diagnostic service. Multiple formats are allowed but they must be semantically equivalent. |
| Control | 0..\* |
| Type | Attachment |
| Requirements | Laboratory needs to be able to provide its own fully formatted report for clinical fidelity |
| Comments | Possible formats: text/html, text/plain, text/rtf, application/msword, application/pdf, application/rtf, application/vnd.oasis.opendocument.text, application/vnd.openxmlformats-officedocument.wordprocessingml.document. Application/pdf is recommended as the most reliable and interoperable in this context |

## 5.19: Resource Formal Definitions: Document

The formal definitions for the [Document (§2.4)](http://hl7.org/implement/standards/fhir/fhir-book.htm#document) resource.

|  |  |
| --- | --- |
| **Document** | |
| Definition | A documentation of healthcare-related information that is assembled together into a single statement of meaning that establishes its own context. A document is composed of a set of resources that include both human and computer readable portions. A human may attest to the accuracy of the human readable portion and may authenticate and/or sign the entire whole. A document may be kept as a set of logically linked resources, or they may be bundled together in an atom feed |
| Control | 1..1 |
| Requirements | For document based framework |
| Comments | While the focus of this specification is on patient-specific clinical documents, this resource can also apply to other healthcare-related documents such as study protocol designs, healthcare invoices and other activities that are not necessarily patient-specific or clinical |
| Invariants | **Defined on this element** **Inv-3**: A document must have a representation, one or more sections or both (xpath: exists(f:representation) or exists(f:section)) |
| To Do | Confidentiality? Language? Consent? Signatures |
| **Document.identifier** | |
| Definition | Logical Identifier for the document, assigned when created. This identifier stays constant when subsequent versions of the document are created |
| Control | 0..1 |
| Type | Identifier |
| Summary | true |
| Comments | see discussion in resource definition for how these relate |
| **Document.versionIdentifier** | |
| Definition | Version specific identifier for the document, assigned when created. This identifier changes when subsequent versions of the document are created |
| Control | 0..1 |
| Type | Identifier |
| Summary | true |
| Comments | see discussion in resource definition for how these relate |
| **Document.created** | |
| Definition | The document creation time, when the document first came into being. Where the document is a transform from an original document in some other format, the ClinicalDocument.effectiveTime is the time the original document is created. |
| Control | 1..1 |
| Type | instant |
| Requirements | Creation time is used for tracking, organizing versions and searching. |
| Summary | true |
| **Document.type** | |
| Definition | Specifies the particular kind of document (e.g. History and Physical, Discharge Summary, Progress Note) |
| Control | 1..1 |
| Binding | DocumentType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-codes)) |
| Type | CodeableConcept from DocumentType |
| Requirements | Key metadata element describing the document, used in searching/filtering. |
| Summary | true |
| **Document.subtype** | |
| Definition | Additional detailed type for the document |
| Control | 0..1 |
| Binding | DocumentSubType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-typecodes)) |
| Type | CodeableConcept from DocumentSubType |
| Requirements | Helps humans to assess whether the document is of interest when viewing an index of documents |
| Summary | true |
| **Document.title** | |
| Definition | Official human-readable label for the document |
| Control | 0..1 |
| Type | string |
| Requirements | Need to be able to mark interim, amended, or withdrawn documents |
| Summary | true |
| Comments | It's commonly the case that clinical documents do not have a title and are collectively referred to by the display name of Document.type (e.g. a "consultation" or "progress note"). Where these display names are rendered to the clinician or where the document has a unique title, the Document.title value should be used |
| **Document.status** | |
| Definition | The workflow/clinical status of this document. The status is a rough guide to the clinical standing of the document |
| Control | 1..1 |
| Binding | DocumentStatus : The workflow/clinical status of this document (see [http://hl7.org/fhir/document-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-status) for values) |
| Type | code from DocumentStatus |
| Must Understand | true |
| Requirements | Identifies who is responsible for the entry of the data. |
| Summary | true |
| Comments | A document marked as an amendment SHOULD replace another document. However the amended flag is not the same as a replacement statement - the amendment flag is looser, and indicates that other related documents about the same thing have been released in \*some\* context prior to the release of this document. If a document is marked as withdrawn, the document, or data from the document, should never be displayed to a user without being clearly marked as untrustworthy. The flag "withdrawn" is why this element is labelled as a modifier of other elements |
| **Document.confidentiality** | |
| Definition | The code specifying the level of confidentiality of the XDS Document. These codes are specific to an XDS Affinity Domain. |
| Control | 1..1 |
| Binding | DocumentConfidentiality : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-confidentiality)) |
| Type | Coding from DocumentConfidentiality |
| Must Understand | true |
| Requirements | Essential metadata for searching for the document, identifies who the document applies to |
| Summary | true |
| Comments | Enforcement and issues related to highly sensitive documents are beyond the scope of XDS (see security section). confidentialityCode is part of a codification scheme and value set enforced by the Document Registry. |
| **Document.subject** | |
| Definition | Who or what the document is about. The document can be about a person, (patient or healthcare practitioner), a device (I.e. machine) or even a group of subjects (such as a document about a herd of farm animals, or a set of patients that share a common exposure) |
| Control | 1..1 |
| Type | Resource(Patient|Practitioner|Group|Device) |
| Requirements | Provides context as to the potential accuracy of the information |
| Summary | true |
| Comments | For clinical documents, this is usually the patient. |
| To Do | Need to extend this to support documents with other types of subjects. Also rationalize with encounter & context elements |
| **Document.author** | |
| Definition | Identifies who is responsible for the information in the document. (Not necessarily who typed it in.) |
| Control | 1..\* |
| Type | Resource(Practitioner|Device) |
| Requirements | Identifies responsibility for the accuracy of the document content. |
| Summary | true |
| **Document.attester** | |
| Definition | A participant who has attested to the accuracy of the document |
| Control | 0..\* |
| Requirements | Indicates the level of officialness of the attestation. |
| Summary | true |
| **Document.attester.mode** | |
| Definition | The type of attestation the authenticator offers |
| Control | 1..1 |
| Binding | DocumentAttestationMode : The way in which a person authenticated a document (see [http://hl7.org/fhir/document-attestation-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-attestation-mode) for values) |
| Type | code from DocumentAttestationMode |
| Requirements | Identifies when the information in the document was deemed accurate. (Things may have changed since then.) |
| Summary | true |
| **Document.attester.time** | |
| Definition | When document was attested by the party |
| Control | 0..1 |
| Type | dateTime |
| Requirements | Identifies who has taken on the responsibility for accuracy of the document content. |
| Summary | true |
| **Document.attester.party** | |
| Definition | Who attested the document in the specified way |
| Control | 0..1 |
| Type | Resource(Patient|Practitioner|Organization) |
| Requirements | Used for routing and also provides context as to intended audience. |
| Summary | true |
| **Document.custodian** | |
| Definition | Identifies the organization or group who is responsible for ongoing maintenance of and access to the document. |
| Control | 0..1 |
| Type | Resource(Organization) |
| Requirements | Provides context for the document and creates a linkage between a resource describing an event and the document created describing the event. |
| Summary | true |
| **Document.event** | |
| Definition | The main event/act/item, such as a colonoscopy or an appendectomy, being documented |
| Control | 0..1 |
| Summary | true |
| Comments | The event needs to be consistent with the type element, though can provide further information if desired |
| **Document.event.code** | |
| Definition | This list of codes represents the main clinical acts, such as a colonoscopy or an appendectomy, being documented. In some cases, the event is inherent in the typeCode, such as a "History and Physical Report" in which the procedure being documented is necessarily a "History and Physical" act. |
| Control | 0..\* |
| Binding | DocumentEventCode : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-event-code)) |
| Type | CodeableConcept from DocumentEventCode |
| Summary | true |
| Comments | An event can further specialize the act inherent in the typeCode, such as where it is simply "Procedure Report" and the procedure was a "colonoscopy". If one or more eventCodes are included, they shall not conflict with the values inherent in the classCode, practiceSettingCode or typeCode, as such a conflict would create an ambiguous situation. This short list of codes is provided to be used as “key words” for certain types of queries. |
| **Document.event.period** | |
| Definition | The period of time covered by the document. There is no assertion that the document is a complete representation for this period, only that it documents events during this time |
| Control | 0..1 |
| Type | Period |
| Summary | true |
| **Document.event.detail** | |
| Definition | Full details for the event(s) the document contents |
| Control | 0..\* |
| Type | Resource(Any) |
| Requirements | Provides context for the document and supports searching. |
| Summary | true |
| **Document.encounter** | |
| Definition | Describes the clinical encounter or type of care this document is associated with. |
| Control | 0..1 |
| Type | Resource(Encounter|InterestOfCare) |
| Requirements | Used to establish relationships between documents to determine which is the most current/authoritative. |
| Summary | true |
| **Document.replaces** | |
| Definition | Identifies the document this document supersedes, if any. |
| Control | 0..1 |
| Type | id |
| Must Understand | true |
| Requirements | Identifies who is responsible for the entry of the data. |
| Summary | true |
| Comments | This is labelled as "Is Modifier" because applications must be aware of document replacement semantics and behave appropriately |
| **Document.provenance** | |
| Definition | Additional provenance about the document and the resources that are the sections |
| Control | 0..\* |
| Type | Resource(Provenance) |
| **Document.stylesheet** | |
| Definition | A fixed CSS stylesheet to use when rendering the documents |
| Control | 0..1 |
| Type | Attachment |
| Requirements | Support for CDA level 1 |
| Invariants | **Defined on this element** **Inv-4**: A document stylesheet must have a mime type of text/css (xpath: f:mimeType/@value = 'text/css')**Affect this element** **Inv-4**: A document stylesheet must have a mime type of text/css (xpath: f:mimeType/@value = 'text/css') |
| **Document.representation** | |
| Definition | An alternative representation of the document that can be used in place of the html based rendering |
| Control | 0..1 |
| Type | Attachment |
| Requirements | Adds organization and human navigability to the information in the document. |
| Comments | Typically, this is application/pdf |
| Invariants | **Affect this element** **Inv-3**: A document must have a representation, one or more sections or both (xpath: exists(f:representation) or exists(f:section)) |
| **Document.section** | |
| Definition | Identifies a main topic within the document's table of contents |
| Control | 0..\* |
| Requirements | Provides computable standardized labels to topics within the document. |
| Invariants | **Defined on this element** **Inv-2**: A section must have content or one or more sections, but not both. (xpath: exists(f:content) != exists(f:section))**Affect this element** **Inv-3**: A document must have a representation, one or more sections or both (xpath: exists(f:representation) or exists(f:section)) |
| **Document.section.code** | |
| Definition | A code identifying the kind of content contained within the section |
| Control | 0..1 |
| Binding | DocumentSectionCode : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-section-codes)) |
| Type | CodeableConcept from DocumentSectionCode |
| **Document.section.subject** | |
| Definition | Identifies the primary subject of the section. |
| Control | 0..1 |
| Type | Resource(Patient|Group|Device) |
| Must Understand | true |
| Requirements | Provides context as to the potential accuracy of the information |
| Comments | This is labelled as "Is Modifier" because applications must be aware if the subject changes for a particular section |
| **Document.section.content** | |
| Definition | Identifies the discrete data that provides the content for the section. |
| Control | 0..1 |
| Type | Resource(Any) |
| Comments | Because documents represent point-in-time snapshots, resource references should generally be to a specific version. |
| Invariants | **Affect this element** **Inv-2**: A section must have content or one or more sections, but not both. (xpath: exists(f:content) != exists(f:section)) |
| To Do | This may need to be 0..\*. May need to consider adding text here to account for missing resources. |
| **Document.section.section** | |
| Definition | Identifies a subtopic within the section as part of the document's table of contents |
| Control | 0..\* |
| Type | @Document.section |
| Invariants | **Affect this element** **Inv-2**: A section must have content or one or more sections, but not both. (xpath: exists(f:content) != exists(f:section)) |

## 5.20: Resource Formal Definitions: DocumentReference

The formal definitions for the [DocumentReference (§3.14)](http://hl7.org/implement/standards/fhir/fhir-book.htm#documentreference) resource.

|  |  |
| --- | --- |
| **DocumentReference** | |
| Definition | A reference to a document |
| Control | 1..1 |
| Comments | Usually, this is used for documents other than those defined by FHIR |
| Invariants | **Defined on this element** **Inv-1**: A location or a service (or both) must be provided (xpath: exists(f:location) or exists(f:service)) |
| **DocumentReference.masterIdentifier** | |
| Definition | Document identifier as assigned by the source of the document. This identifier is specific to this version of the document. This unique identifier may be used elsewhere to identify this version of the document |
| Control | 1..1 |
| Type | Identifier |
| **DocumentReference.identifier** | |
| Definition | Other identifiers associated with the record |
| Control | 0..\* |
| Type | Identifier |
| **DocumentReference.subject** | |
| Definition | Who or what the document is about. The document can be about a person, (patient or healthcare practitioner), a device (I.e. machine) or even a group of subjects (such as a document about a herd of farm animals, or a set of patients that share a common exposure) |
| Control | 1..1 |
| Type | Resource(Patient|Practitioner|Group|Device) |
| **DocumentReference.type** | |
| Definition | Specifies the particular kind of document (e.g. Patient Summary, Discharge Summary, Prescription, etc.) |
| Control | 1..1 |
| Binding | DocumentType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-codes)) |
| Type | CodeableConcept from DocumentType |
| Comments | Key metadata element describing the document, used in searching/filtering. |
| **DocumentReference.subtype** | |
| Definition | More detailed information about the document type |
| Control | 0..1 |
| Binding | DocumentSubType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-typecodes)) |
| Type | CodeableConcept from DocumentSubType |
| **DocumentReference.author** | |
| Definition | Identifies who is responsible for adding the information to the document |
| Control | 1..\* |
| Type | Resource(Practitioner|Device) |
| Comments | Not necessarily who did the actual data entry (i.e. typist) it in or who was the source (informant) |
| **DocumentReference.custodian** | |
| Definition | Identifies the organization or group who is responsible for ongoing maintenance of and access to the document |
| Control | 0..1 |
| Type | Resource(Organization) |
| Comments | Identifies where to go to find the current version, where to report issues, etc. |
| **DocumentReference.authenticator** | |
| Definition | Which person or organization authenticates that this document is valid |
| Control | 0..1 |
| Type | Resource(Practitioner|Organization) |
| **DocumentReference.created** | |
| Definition | When the document was created |
| Control | 0..1 |
| Type | dateTime |
| Comments | Creation time is used for tracking, organizing versions and searching. This is the creation time of the document, not the source material on which it is based |
| **DocumentReference.indexed** | |
| Definition | When the document reference was created |
| Control | 1..1 |
| Type | instant |
| Comments | Referencing/indexing time is used for tracking, organizing versions and searching. |
| **DocumentReference.status** | |
| Definition | The status of this document reference |
| Control | 1..1 |
| Binding | DocumentReferenceStatus : The status of the document reference (see [http://hl7.org/fhir/document-reference-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#document-reference-status) for values) |
| Type | code from DocumentReferenceStatus |
| Must Understand | true |
| **DocumentReference.docStatus** | |
| Definition | The status of the underlying document |
| Control | 0..1 |
| Binding | ReferredDocumentStatus : ([Value Set Definition (http://hl7.org/fhir/vs/document-status.htm)](http://hl7.org/fhir/vs/document-status.htm) ) |
| Type | CodeableConcept from ReferredDocumentStatus |
| **DocumentReference.supercedes** | |
| Definition | If this document replaces another |
| Control | 0..1 |
| Type | Resource(DocumentReference) |
| Must Understand | true |
| **DocumentReference.description** | |
| Definition | Human Readable description of the source document. This is sometimes known as the "title" |
| Control | 0..1 |
| Type | string |
| Requirements | Helps humans to assess whether the document is of interest |
| Comments | What the document is about, rather than a terse summary of the document. It's commonly the case that records do not have a title and are collectively referred to by the display name of Record code (e.g. a "consultation" or "progress note"). |
| **DocumentReference.confidentiality** | |
| Definition | A code specifying the level of confidentiality of the XDS Document |
| Control | 0..1 |
| Binding | DocumentConfidentiality : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-confidentiality)) |
| Type | CodeableConcept from DocumentConfidentiality |
| Must Understand | true |
| Comments | The interpretation of this field, and more generally enforcement and issues related to highly sensitive documents are beyond the scope of this resource. confidentialityCode can only be understood in the context of the policies, procedures, and value set specified by the context in which the document reference is being used |
| **DocumentReference.primaryLanguage** | |
| Definition | The primary language in which the source document is written |
| Control | 0..1 |
| Binding | Language : see [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |
| Type | code from Language |
| **DocumentReference.mimeType** | |
| Definition | The mime type of the source document |
| Control | 1..1 |
| Binding | MimeType : see [BCP 13 (RFCs 2045, 2046, 2047, 4288, 4289 and 2049) (http://www.rfc-editor.org/bcp/bcp13.txt)](http://www.rfc-editor.org/bcp/bcp13.txt) |
| Type | code from MimeType |
| Comments | Note: application/hl7-v3+xml for CDA. application/binary for proprietary record formats |
| **DocumentReference.format** | |
| Definition | The format of the document. This is used when the mimeType of the document does not provide enough differentiating information (typically, when the mime type of the document is text/xml) |
| Control | 0..1 |
| Binding | DocumentFormat : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-formatcodes)) |
| Type | CodeableConcept from DocumentFormat |
| **DocumentReference.size** | |
| Definition | The size of the source document this reference refers to in bytes |
| Control | 0..1 |
| Type | integer |
| **DocumentReference.hash** | |
| Definition | A hash of the source document to ensure that changes have not occurred |
| Control | 0..1 |
| Type | string |
| Comments | Whether the hash must be present and/or correct depends on the document handling rules defined in the context of use |
| **DocumentReference.location** | |
| Definition | A url at which the document can be accessed |
| Control | 0..1 |
| Type | uri |
| Invariants | **Affect this element** **Inv-1**: A location or a service (or both) must be provided (xpath: exists(f:location) or exists(f:service)) |
| **DocumentReference.service** | |
| Definition | A description of a service call that can be used to retrieve the document |
| Control | 0..1 |
| Comments | If a document can be accessed by either a service or directly by a URL (i.e. an XDS repository with an MHD access point, or a DICOM network with a WADO portal) just provide the URL |
| Invariants | **Affect this element** **Inv-1**: A location or a service (or both) must be provided (xpath: exists(f:location) or exists(f:service)) |
| **DocumentReference.service.type** | |
| Definition | The type of the service that can be used to access the documents |
| Control | 1..1 |
| Binding | DocumentServiceType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-documentreference-service-types)) |
| Type | CodeableConcept from DocumentServiceType |
| Comments | The meaning and interpretation of the parameters depends on the service type |
| **DocumentReference.service.address** | |
| Definition | Where the service end-point is located |
| Control | 0..1 |
| Type | string |
| Comments | Usually this is a URL, but for some services, the end-point is a simple network name or address that is not a valid URL |
| **DocumentReference.service.parameter** | |
| Definition | A list of named parameters that is used in the service call |
| Control | 0..\* |
| Comments | The interpretation of the parameters, and how to convert them into a proper service call, is dependent on the type of the service, and needs to be specified in an implementation guide somewhere |
| **DocumentReference.service.parameter.name** | |
| Definition | The name of a parameter |
| Control | 1..1 |
| Type | string |
| **DocumentReference.service.parameter.value** | |
| Definition | The value of the named parameter |
| Control | 0..1 |
| Type | string |
| **DocumentReference.context** | |
| Definition | The clinical context in which the document was prepared |
| Control | 0..1 |
| Comments | These values are primarily added to help with searching for interesting/relevant documents |
| **DocumentReference.context.code** | |
| Definition | The type of clinical context, such as a kind of surgery, or a kind of speciality, or a clinical type |
| Control | 0..\* |
| Binding | DocumentEventCode : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-doc-event-code)) |
| Type | CodeableConcept from DocumentEventCode |
| **DocumentReference.context.period** | |
| Definition | The time period of the patient's care that is described by the document |
| Control | 0..1 |
| Type | Period |
| **DocumentReference.context.facilityType** | |
| Definition | The kind of facility where the patient was seen |
| Control | 0..1 |
| Binding | DocumentFacilityType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-xds-facilitycodes)) |
| Type | CodeableConcept from DocumentFacilityType |

## 5.21: Resource Formal Definitions: Encounter

The formal definitions for the [Encounter (§3.15)](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter) resource.

|  |  |
| --- | --- |
| **Encounter** | |
| Definition | An interaction between a patient and healthcare provider(s) for the purpose of providing healthcare service(s) or assessing the health status of a patient. |
| Control | 1..1 |
| Aliases | Visit |
| **Encounter.identifier** | |
| Definition | Identifier(s) by which this encounter is known |
| Control | 0..\* |
| Type | Identifier |
| Summary | true |
| **Encounter.status** | |
| Definition | E.g. active, aborted, finished |
| Control | 1..1 |
| Binding | EncounterState : Current state of the encounter (see [http://hl7.org/fhir/encounter-state](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-state) for values) |
| Type | code from EncounterState |
| Must Understand | true |
| Summary | true |
| **Encounter.class** | |
| Definition | Inpatient | Outpatient etc. |
| Control | 1..1 |
| Binding | EncounterClass : Classification of the encounter (see [http://hl7.org/fhir/encounter-class](http://hl7.org/implement/standards/fhir/fhir-book.htm#encounter-class) for values) |
| Type | code from EncounterClass |
| Must Understand | true |
| Summary | true |
| **Encounter.type** | |
| Definition | Specific type of encounter (e.g. e-mail consultation, surgical day-care, skilled nursing, rehabilitation) |
| Control | 0..\* |
| Binding | EncounterType : A specific code indicating type of service provided ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-type)) |
| Type | CodeableConcept from EncounterType |
| Summary | true |
| Comments | Since there are many ways to further classify encounters, this element is 0..\* |
| **Encounter.subject** | |
| Definition | The patient present at the encounter |
| Control | 0..1 |
| Type | Resource(Patient) |
| Aliases | patient |
| Summary | true |
| Comments | While the encounter is always about the patient, the patient may not actually be known in all contexts of use |
| **Encounter.participant** | |
| Definition | The main practitioner responsible for providing the service |
| Control | 0..\* |
| Summary | true |
| **Encounter.participant.type** | |
| Definition | Kind of involvement of the participant |
| Control | 0..\* |
| Binding | ParticipantType : Kind of participation (see [http://hl7.org/fhir/participant-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#participant-type) for values) |
| Type | code from ParticipantType |
| Summary | true |
| **Encounter.participant.practitioner** | |
| Definition | The practitioner that is involved |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Summary | true |
| **Encounter.fulfills** | |
| Definition | The appointment that scheduled this encounter |
| Control | 0..1 |
| Type | Resource(Appointment) |
| Summary | true |
| **Encounter.start** | |
| Definition | The date and time the encounter starts, e.g. the patient arrives |
| Control | 0..1 |
| Type | dateTime |
| **Encounter.length** | |
| Definition | Quantity of time the encounter lasted. This excludes the time during leaves of absence. |
| Control | 0..1 |
| Type | Duration |
| **Encounter.reason[x]** | |
| Definition | Reason the encounter takes place |
| Control | 0..1 |
| Binding | EncounterReason : Reason |
| Type | string|CodeableConcept from EncounterReason |
| Summary | true |
| **Encounter.indication** | |
| Definition | Reason the encounter takes place |
| Control | 0..1 |
| Type | Resource(Any) |
| **Encounter.priority** | |
| Definition | Indicates the urgency of the encounter |
| Control | 0..1 |
| Binding | Priority : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-priority)) |
| Type | CodeableConcept from Priority |
| **Encounter.hospitalization** | |
| Definition | Details about an admission to a clinic |
| Control | 0..1 |
| **Encounter.hospitalization.preAdmissionIdentifier** | |
| Definition | Pre-admission identifier |
| Control | 0..1 |
| Type | Identifier |
| **Encounter.hospitalization.preAdmissionTest** | |
| Definition | Tests to be done before admission |
| Control | 0..1 |
| Binding | PreAdminTest : Tests done before admission |
| Type | CodeableConcept from PreAdminTest |
| **Encounter.hospitalization.origin** | |
| Definition | The location the patient came from before admission |
| Control | 0..1 |
| Type | Resource(Location) |
| **Encounter.hospitalization.admitSource** | |
| Definition | Where the patient was admitted from (physician referral, transfer) |
| Control | 0..1 |
| Binding | AdmitSource : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-admit-source)) |
| Type | CodeableConcept from AdmitSource |
| **Encounter.hospitalization.period** | |
| Definition | Period of hospitalization. |
| Control | 0..1 |
| Type | Period |
| Comments | May differ from start + length, since length excludes leaves of absence. |
| **Encounter.hospitalization.accomodation** | |
| Definition | Where the patient stays during this encounter |
| Control | 0..\* |
| **Encounter.hospitalization.accomodation.bed** | |
| Definition | Bed |
| Control | 0..1 |
| Type | Resource(Location) |
| **Encounter.hospitalization.accomodation.period** | |
| Definition | Period during which the patient was assigned the bed |
| Control | 0..1 |
| Type | Period |
| **Encounter.hospitalization.diet** | |
| Definition | Dietary restrictions for the patient |
| Control | 0..1 |
| Binding | PatientDiet : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-diet)) |
| Type | CodeableConcept from PatientDiet |
| Requirements | Track patients reported dietary restrictions to help with catering requirements |
| **Encounter.hospitalization.specialCourtesy** | |
| Definition | Special courtesies (VIP, hospital board member) |
| Control | 0..\* |
| Binding | Courtesies : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-special-courtesy)) |
| Type | CodeableConcept from Courtesies |
| **Encounter.hospitalization.specialArrangement** | |
| Definition | Special arrangements (wheelchair, translator, stretcher) |
| Control | 0..\* |
| Binding | Arrangements : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-special-arrangements)) |
| Type | CodeableConcept from Arrangements |
| **Encounter.hospitalization.destination** | |
| Definition | Location the patient is discharged to |
| Control | 0..1 |
| Type | Resource(Location) |
| **Encounter.hospitalization.dischargeDisposition** | |
| Definition | Disposition a patient was released into |
| Control | 0..1 |
| Binding | DischargeDisp : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-encounter-discharge-disposition)) |
| Type | CodeableConcept from DischargeDisp |
| **Encounter.hospitalization.reAdmission** | |
| Definition | Is readmission? |
| Control | 0..1 |
| Type | boolean |
| **Encounter.location** | |
| Definition | List of locations the patient has been at. |
| Control | 0..\* |
| **Encounter.location.location** | |
| Definition | The location the encounter takes place |
| Control | 1..1 |
| Type | Resource(Location) |
| **Encounter.location.period** | |
| Definition | Time period during which the patient was present at the location |
| Control | 1..1 |
| Type | Period |
| **Encounter.serviceProvider** | |
| Definition | The department or team that is providing care |
| Control | 0..1 |
| Type | Resource(Organization) |
| **Encounter.partOf** | |
| Definition | Another Encounter this encounter is part of (administratively or in time) |
| Control | 0..1 |
| Type | Resource(Encounter) |

## 5.22: Resource Formal Definitions: FamilyHistory

The formal definitions for the [FamilyHistory (§3.16)](http://hl7.org/implement/standards/fhir/fhir-book.htm#familyhistory) resource.

|  |  |
| --- | --- |
| **FamilyHistory** | |
| Definition | Significant health events and conditions for people related to the subject relevant in the context of care for the subject |
| Control | 1..1 |
| **FamilyHistory.subject** | |
| Definition | The person who this history concerns |
| Control | 1..1 |
| Type | Resource(Patient) |
| Summary | true |
| **FamilyHistory.note** | |
| Definition | Conveys information about family history not specific to individual relations. |
| Control | 0..1 |
| Type | string |
| **FamilyHistory.relation** | |
| Definition | The related person. Each FamilyHistory resource contains the entire family history for a single person. |
| Control | 0..\* |
| **FamilyHistory.relation.name** | |
| Definition | This will either be a name or a description. E.g. "Aunt Susan", "my cousin with the red hair" |
| Control | 0..1 |
| Type | string |
| Requirements | Allows greater ease in ensuring the same person is being talked about |
| Summary | true |
| **FamilyHistory.relation.relationship** | |
| Definition | The type of relationship this person has to the patient (father, mother, brother etc.) At the moment this is a code linking to a fixed set of values. I'm not sure if there is an international standard for this. A fixed (possibly extensible) set of codes feels better than a codeable concept for something like this... |
| Control | 1..1 |
| Binding | FamilialRelationship : The nature of the relationship between the patient and the person with the condition. Based on the HL7v3 RoleCode: OID: 2.16.840.1.113883.5.111 with some inappropriate items removed (see [http://hl7.org/fhir/familial-relationship](http://hl7.org/implement/standards/fhir/fhir-book.htm#familial-relationship) for values) |
| Type | CodeableConcept from FamilialRelationship |
| Summary | true |
| **FamilyHistory.relation.deceased[x]** | |
| Definition | If this resource is indicating that the related person is deceased, then an indicator of whether the person is deceased (yes) or not (no) or the age or age range or description of age at death - can be indicated here. If the reason for death is known, then it can be indicated in the outcome code of the condition - in this case the deceased property should still be set. |
| Control | 0..1 |
| Type | boolean|Age|Range|string |
| **FamilyHistory.relation.note** | |
| Definition | This property allows a non condition-specific note to the made about the related person. Ideally, the note would be in the condition property, but this is not always possible. |
| Control | 0..1 |
| Type | string |
| **FamilyHistory.relation.condition** | |
| Definition | The significant Conditions (or condition) that the family member had. This is a repeating section to allow a system to represent more than one condition per resource, though there is nothing stopping multiple resources - one per condition. |
| Control | 0..\* |
| **FamilyHistory.relation.condition.type** | |
| Definition | The actual condition specified. Could be a coded condition (like MI or Diabetes) or a less specific string like 'cancer' depending on how much is known about the condition and the capabilities of the creating system |
| Control | 1..1 |
| Type | CodeableConcept |
| **FamilyHistory.relation.condition.outcome** | |
| Definition | Indicates what happened as a result of this condition. If the condition resulted in death, deceased date is captured on the relation. |
| Control | 0..1 |
| Binding | ConditionOutcome : The result of the condition for the patient. E.g. death, permanent disability, temporary disability, etc. |
| Type | CodeableConcept from ConditionOutcome |
| **FamilyHistory.relation.condition.onset[x]** | |
| Definition | Either the age of onset, range of approximate age or descriptive string can be recorded. |
| Control | 0..1 |
| Type | Age|Range|string |
| **FamilyHistory.relation.condition.note** | |
| Definition | An area where general notes can be placed about this specific condition. |
| Control | 0..1 |
| Type | string |

## 5.23: Resource Formal Definitions: Group

The formal definitions for the [Group (§3.17)](http://hl7.org/implement/standards/fhir/fhir-book.htm#group) resource.

|  |  |
| --- | --- |
| **Group** | |
| Definition | Represents a defined collection of entities that may be discussed or acted upon collectively but which are not expected to act collectively and are not formally or legally recognized. I.e. A collection of entities that isn't an Organization |
| Control | 1..1 |
| Invariants | **Defined on this element** **Inv-1**: Can only have members if group is "actual" (xpath: f:actual/@value='true' or not(exists(f:member))) **Inv-4**: Can't have more members associated with the group than the value specified for "quantity" (xpath: not(f:quantity) or not(f:member) or not(f:quantity>count(f:member))) |
| To Do | We need determiner codes that indicate we're talking about a group even when we haven't specified a specific quantity |
| **Group.identifier** | |
| Definition | A unique business identifier for this group |
| Control | 0..1 |
| Type | Identifier |
| Requirements | Allows the group to be referenced |
| Summary | true |
| **Group.type** | |
| Definition | Identifies the broad classification of the kind of resources the group includes |
| Control | 1..1 |
| Binding | GroupType : Types of resources that are part of group (see [http://hl7.org/fhir/group-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#group-type) for values) |
| Type | code from GroupType |
| Requirements | Identifies what type of resources the group is made up of |
| Summary | true |
| **Group.actual** | |
| Definition | If true, indicates that the resource refers to a specific group of real individuals. If false, the group defines a set of intended individuals |
| Control | 1..1 |
| Type | boolean |
| Requirements | There are use-cases for groups that define specific collections of individuals, and other groups that define "types" of intended individuals. The requirements for both kinds of groups are similar, so we use a single resource, distinguished by this flag. |
| Summary | true |
| Invariants | **Affect this element** **Inv-1**: Can only have members if group is "actual" (xpath: f:actual/@value='true' or not(exists(f:member))) |
| **Group.code** | |
| Definition | Provides a specific type of resource the group includes. E.g. "cow", "syringe", etc. |
| Control | 0..1 |
| Binding | GroupCode : Kind of particular resource |
| Type | CodeableConcept from GroupCode |
| Summary | true |
| Comments | This would generally be omitted for Person resources |
| **Group.name** | |
| Definition | A label assigned to the group for human identification and communication |
| Control | 0..1 |
| Type | string |
| Requirements | Used to identify the group in human communication |
| Summary | true |
| **Group.quantity** | |
| Definition | A count of the number of resource instances that are part of the group |
| Control | 0..1 |
| Type | integer |
| Requirements | Group size is a common defining characteristic |
| Summary | true |
| **Group.characteristic** | |
| Definition | Identifies the traits shared by members of the group |
| Control | 0..\* |
| Requirements | Needs to be a generic mechanism for identifying what individuals can be part of a group |
| **Group.characteristic.type** | |
| Definition | Identifies the kind of trait being asserted |
| Control | 1..1 |
| Binding | GroupCharacteristicType : List of characteristics used to describe group members. E.g. gender, age, owner, location, etc. |
| Type | CodeableConcept from GroupCharacteristicType |
| Requirements | Need a formal way of identifying the characteristic being described |
| **Group.characteristic.value[x]** | |
| Definition | The value of the trait that holds (or does not hold - see 'exclude') for members of the group |
| Control | 1..1 |
| Binding | GroupCharacteristicValue : Value of descriptive member characteristic |
| Type | CodeableConcept|string|boolean|Quantity|Range from GroupCharacteristicValue |
| Requirements | The value of the characteristic is what determines group membership. |
| Comments | For Range, it means members of the group have a value that falls somewhere within the specified range. |
| **Group.characteristic.exclude** | |
| Definition | If true, indicates the characteristic is one that is NOT held by members of the group |
| Control | 1..1 |
| Type | boolean |
| Must Understand | true |
| Requirements | Sometimes group membership is determined by characteristics not possessed |
| Comments | This is labelled as "Is Modifier" because applications cannot wrongly include excluded members as included or vice versa |
| **Group.member** | |
| Definition | Identifies the resource instances that are members of the group. |
| Control | 0..\* |
| Type | Resource(Patient|Practitioner|Device|Medication) |
| Requirements | Often the only thing of interest about a group is "who's in it" |
| Invariants | **Defined on this element** **Inv-3**: Member resource types must agree with group type (xpath: lower-case(f:type/@value)=parent::f:Group/f:type/@value or (f:type/@value='Patient' and parent::f:Group/f:type/@value=('animal','person')))**Affect this element** **Inv-1**: Can only have members if group is "actual" (xpath: f:actual/@value='true' or not(exists(f:member))) |

## 5.24: Resource Formal Definitions: ImagingStudy

The formal definitions for the [ImagingStudy (§3.18)](http://hl7.org/implement/standards/fhir/fhir-book.htm#imagingstudy) resource.

|  |  |
| --- | --- |
| **ImagingStudy** | |
| Definition | Manifest of a set of images produced in study. The set of images may include every image in the study, or it may be an incomplete sample, such as a list of key images |
| Control | 1..1 |
| Aliases | Manifest; XDS-I summary; Key Images |
| **ImagingStudy.dateTime** | |
| Definition | Date and Time the study took place |
| Control | 0..1 |
| Type | dateTime |
| Aliases | StudyDate; StudyTime |
| **ImagingStudy.subject** | |
| Definition | Who the images are of |
| Control | 1..1 |
| Type | Resource(Patient) |
| **ImagingStudy.uid** | |
| Definition | Formal identifier for the study |
| Control | 1..1 |
| Type | oid |
| Aliases | StudyInstanceUID |
| **ImagingStudy.accessionNo** | |
| Definition | Accession Number |
| Control | 0..1 |
| Type | Identifier |
| Aliases | AccessionNumber |
| **ImagingStudy.identifier** | |
| Definition | Other identifiers for the study |
| Control | 0..\* |
| Type | Identifier |
| Aliases | Study ID |
| **ImagingStudy.modalities** | |
| Definition | A list of all the Series.ImageModality values that are actual acquisition modalities, i.e. those in the DICOM Context Group 29 (value set OID 1.2.840.10008.6.1.19) |
| Control | 0..\* |
| Binding | ImagingModality : Type of acquired image data in the instance (see [http://hl7.org/fhir/imaging-modality](http://hl7.org/implement/standards/fhir/fhir-book.htm#imaging-modality) for values) |
| Type | code from ImagingModality |
| Aliases | ModalitiesInStudy |
| **ImagingStudy.referrer** | |
| Definition | The requesting/referring physician |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Aliases | ReferringPhysiciansName |
| **ImagingStudy.availability** | |
| Definition | Availability of study (online, offline or nearline) |
| Control | 0..1 |
| Binding | InstanceAvailability : Availability of the resource (see [http://hl7.org/fhir/instance-availability](http://hl7.org/implement/standards/fhir/fhir-book.htm#instance-availability) for values) |
| Type | code from InstanceAvailability |
| Aliases | InstanceAvailability |
| **ImagingStudy.url** | |
| Definition | WADO-RS URI where Study is available |
| Control | 0..1 |
| Type | uri |
| Aliases | RetrieveURI |
| **ImagingStudy.numberOfSeries** | |
| Definition | Number of Series in Study |
| Control | 1..1 |
| Type | integer |
| Aliases | NumberOfStudyRelatedSeries |
| **ImagingStudy.numberOfInstances** | |
| Definition | Number of SOP Instances in Study |
| Control | 1..1 |
| Type | integer |
| Aliases | NumberOfStudyRelatedInstances |
| **ImagingStudy.clinicalInformation** | |
| Definition | Diagnoses etc. provided with request |
| Control | 0..1 |
| Type | string |
| Aliases | Admitting Diagnoses Description |
| **ImagingStudy.procedure** | |
| Definition | Type of procedure performed |
| Control | 0..\* |
| Type | Coding |
| Aliases | Procedure Code Sequence |
| **ImagingStudy.interpreter** | |
| Definition | Who read study and interpreted the images |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Aliases | Name of Physician(s) Reading Study |
| Comments | or is this 4008,010C? |
| **ImagingStudy.description** | |
| Definition | Institution-generated description or classification of the Study (component) performed |
| Control | 0..1 |
| Type | string |
| **ImagingStudy.series** | |
| Definition | Each study has one or more series of image instances |
| Control | 0..\* |
| **ImagingStudy.series.number** | |
| Definition | The number of this series in the overall sequence |
| Control | 0..1 |
| Type | integer |
| Aliases | SeriesNumber |
| **ImagingStudy.series.modality** | |
| Definition | The modality of this sequence |
| Control | 1..1 |
| Binding | Modality : Type of data in the instance (see [http://hl7.org/fhir/modality](http://hl7.org/implement/standards/fhir/fhir-book.htm#modality) for values) |
| Type | code from Modality |
| Aliases | Modality |
| **ImagingStudy.series.uid** | |
| Definition | Formal identifier for this series |
| Control | 1..1 |
| Type | oid |
| Aliases | SeriesInstanceUID |
| **ImagingStudy.series.description** | |
| Definition | A description of the series |
| Control | 0..1 |
| Type | string |
| Aliases | SeriesDescription |
| **ImagingStudy.series.numberOfInstances** | |
| Definition | Sequence that contains attributes from the |
| Control | 1..1 |
| Type | integer |
| Aliases | NumberOfSeriesRelatedInstances |
| **ImagingStudy.series.availability** | |
| Definition | Availability of series (online, offline or nearline) |
| Control | 0..1 |
| Binding | InstanceAvailability : Availability of the resource (see [http://hl7.org/fhir/instance-availability](http://hl7.org/implement/standards/fhir/fhir-book.htm#instance-availability) for values) |
| Type | code from InstanceAvailability |
| Aliases | InstanceAvailability |
| **ImagingStudy.series.url** | |
| Definition | WADO-RS URI where Series is available |
| Control | 0..1 |
| Type | uri |
| Aliases | RetrieveURI |
| **ImagingStudy.series.bodySite** | |
| Definition | Body part examined. See DICOM Part 16 Annex L for the mapping from DICOM to Snomed |
| Control | 0..1 |
| Binding | BodySite : SNOMED-CT Body site concepts ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site)) |
| Type | Coding from BodySite |
| Aliases | BodyPartExamined |
| **ImagingStudy.series.dateTime** | |
| Definition | When the series started |
| Control | 0..1 |
| Type | dateTime |
| **ImagingStudy.series.instance** | |
| Definition | A single image taken from a patient |
| Control | 1..\* |
| **ImagingStudy.series.instance.number** | |
| Definition | The number of this image in the series |
| Control | 0..1 |
| Type | integer |
| Aliases | Instance Number |
| **ImagingStudy.series.instance.uid** | |
| Definition | Formal identifier for this image |
| Control | 1..1 |
| Type | oid |
| Aliases | SOP Instance UID |
| **ImagingStudy.series.instance.sopclass** | |
| Definition | DICOM Image type |
| Control | 1..1 |
| Type | oid |
| Aliases | SOP Class UID |
| **ImagingStudy.series.instance.type** | |
| Definition | Type of instance (0004,1430) |
| Control | 0..1 |
| Type | string |
| Aliases | Directory Record Type |
| **ImagingStudy.series.instance.title** | |
| Definition | Description to be provided |
| Control | 0..1 |
| Type | string |
| **ImagingStudy.series.instance.url** | |
| Definition | WADO url where image is available |
| Control | 0..1 |
| Type | uri |
| **ImagingStudy.series.instance.attachment** | |
| Definition | A FHIR resource with content for this instance |
| Control | 0..1 |
| Type | Resource(Any) |

## 5.25: Resource Formal Definitions: Immunization

The formal definitions for the [Immunization (§3.19)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization) resource.

|  |  |
| --- | --- |
| **Immunization** | |
| Definition | Immunization event information |
| Control | 1..1 |
| **Immunization.date** | |
| Definition | Date vaccine administered or was to be administered |
| Control | 1..1 |
| Type | dateTime |
| **Immunization.vaccineType** | |
| Definition | Vaccine that was administered or was to be administered |
| Control | 1..1 |
| Binding | VaccineType : The type of vaccine administered |
| Type | CodeableConcept from VaccineType |
| **Immunization.subject** | |
| Definition | The patient to whom the vaccine was to be administered |
| Control | 1..1 |
| Type | Resource(Patient) |
| **Immunization.refusedIndicator** | |
| Definition | Indicates if the vaccination was refused. |
| Control | 1..1 |
| Type | boolean |
| **Immunization.reported** | |
| Definition | True if this administration was reported rather than directly administered. |
| Control | 1..1 |
| Type | boolean |
| Comments | May need source of reported info (e.g. parent), but leave out for now. |
| **Immunization.performer** | |
| Definition | Clinician that administered the vaccine |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| **Immunization.requester** | |
| Definition | Clinician who ordered the vaccination |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Comments | other participants - delegate to Provenance resource |
| **Immunization.manufacturer** | |
| Definition | Name of vaccine manufacturer |
| Control | 0..1 |
| Type | Resource(Organization) |
| **Immunization.location** | |
| Definition | The service delivery location where the vaccine administration occurred. |
| Control | 0..1 |
| Type | Resource(Location) |
| **Immunization.lotNumber** | |
| Definition | Lot number of the vaccine product |
| Control | 0..1 |
| Type | string |
| **Immunization.expirationDate** | |
| Definition | Date vaccine batch expires |
| Control | 0..1 |
| Type | date |
| **Immunization.site** | |
| Definition | Body site where vaccine was administered |
| Control | 0..1 |
| Binding | ImmunizationSite : The site at which the vaccine was administered |
| Type | CodeableConcept from ImmunizationSite |
| **Immunization.route** | |
| Definition | The path by which the vaccine product is taken into the body. |
| Control | 0..1 |
| Binding | ImmunizationRoute : The route by which the vaccine was administered |
| Type | CodeableConcept from ImmunizationRoute |
| **Immunization.doseQuantity** | |
| Definition | The quantity of vaccine product that was administered |
| Control | 0..1 |
| Type | Quantity |
| **Immunization.explanation** | |
| Definition | Reasons why a vaccine was administered or refused |
| Control | 0..1 |
| **Immunization.explanation.reason** | |
| Definition | Reasons why a vaccine was administered |
| Control | 0..\* |
| Binding | ActImmunizationReason : The reason why a vaccine was administered |
| Type | CodeableConcept from ActImmunizationReason |
| **Immunization.explanation.refusalReason** | |
| Definition | Refusal or exemption reasons |
| Control | 0..\* |
| Binding | ActNoImmunizationReason : The reason why a vaccine administration was refused |
| Type | CodeableConcept from ActNoImmunizationReason |
| **Immunization.reaction** | |
| Definition | Categorical data indicating that an adverse event is associated in time to an immunization |
| Control | 0..\* |
| **Immunization.reaction.date** | |
| Definition | Date of reaction to the immunization |
| Control | 0..1 |
| Type | dateTime |
| **Immunization.reaction.detail** | |
| Definition | Details of the reaction |
| Control | 0..1 |
| Type | Resource(AdverseReaction|Observation) |
| **Immunization.reaction.reported** | |
| Definition | Self-reported indicator |
| Control | 0..1 |
| Type | boolean |
| **Immunization.vaccinationProtocol** | |
| Definition | Contains information about the protocol under which the vaccine was administered |
| Control | 0..1 |
| **Immunization.vaccinationProtocol.doseSequence** | |
| Definition | Nominal position in a series |
| Control | 1..1 |
| Type | integer |
| **Immunization.vaccinationProtocol.description** | |
| Definition | Contains the description about the protocol under which the vaccine was administered |
| Control | 0..1 |
| Type | string |
| **Immunization.vaccinationProtocol.authority** | |
| Definition | Indicates the authority who published the protocol? E.g. ACIP |
| Control | 0..1 |
| Type | Resource(Organization) |
| **Immunization.vaccinationProtocol.series** | |
| Definition | One possible path to achieve presumed immunity against a disease - within the context of an authority |
| Control | 0..1 |
| Type | string |
| **Immunization.vaccinationProtocol.seriesDoses** | |
| Definition | The recommended number of doses to achieve immunity. |
| Control | 0..1 |
| Type | integer |
| **Immunization.vaccinationProtocol.doseTarget** | |
| Definition | The targeted disease |
| Control | 0..1 |
| Binding | VaccinationProtocolDoseTarget : The disease target of the vaccination protocol |
| Type | CodeableConcept from VaccinationProtocolDoseTarget |
| **Immunization.vaccinationProtocol.doseStatus** | |
| Definition | Indicates if the immunization event should "count" against the protocol. |
| Control | 1..1 |
| Binding | VaccinationProtocolDoseStatus : The status of the vaccination protocol (i.e. should this count) |
| Type | CodeableConcept from VaccinationProtocolDoseStatus |
| Comments | May need to differentiate between status declarations by a provider vs. a CDS engine |
| **Immunization.vaccinationProtocol.doseStatusReason** | |
| Definition | Provides an explanation as to why a immunization event should or should not count against the protocol. |
| Control | 0..1 |
| Binding | VaccinationProtocolDoseStatusReason : The reason for the determining if a vaccination should count or why vaccination should not count. |
| Type | CodeableConcept from VaccinationProtocolDoseStatusReason |

## 5.26: Resource Formal Definitions: ImmunizationProfile

The formal definitions for the [ImmunizationProfile (§3.20)](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunizationprofile) resource.

|  |  |
| --- | --- |
| **ImmunizationProfile** | |
| Definition | A patient's point-of-time immunization status and recommendation with optional supporting justification |
| Control | 1..1 |
| **ImmunizationProfile.subject** | |
| Definition | The patient who is the subject of the profile |
| Control | 1..1 |
| Type | Resource(Patient) |
| **ImmunizationProfile.recommendation** | |
| Definition | Vaccine administration recommendations |
| Control | 1..\* |
| **ImmunizationProfile.recommendation.recommendationDate** | |
| Definition | The date of the immunization recommendation |
| Control | 1..1 |
| Type | dateTime |
| **ImmunizationProfile.recommendation.vaccineType** | |
| Definition | Vaccine that pertains to the recommendation |
| Control | 1..1 |
| Binding | VaccineType : The type of vaccine administered |
| Type | CodeableConcept from VaccineType |
| **ImmunizationProfile.recommendation.doseNumber** | |
| Definition | Recommended dose number |
| Control | 0..1 |
| Type | integer |
| Comments | May need other dose concepts such as administered vs. valid |
| **ImmunizationProfile.recommendation.forecastStatus** | |
| Definition | Vaccine administration status |
| Control | 1..1 |
| Binding | ImmunizationForecastStatus : The patient's status with respect to a vaccintion protocol (see [http://hl7.org/fhir/immunization-forecast-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#immunization-forecast-status) for values) |
| Type | code from ImmunizationForecastStatus |
| **ImmunizationProfile.recommendation.dateCriterion** | |
| Definition | Vaccine date recommendations - e.g. earliest date to administer, latest date to administer, etc. |
| Control | 0..\* |
| **ImmunizationProfile.recommendation.dateCriterion.code** | |
| Definition | Date classification of recommendation - e.g. earliest date to give, latest date to give, etc. |
| Control | 1..1 |
| Binding | ImmunizationProfileDateCriterion : Classifies date criterion with respect to conveying information about a patient's vaccination status (e.g. due date, latest to give date, etc.) |
| Type | CodeableConcept from ImmunizationProfileDateCriterion |
| **ImmunizationProfile.recommendation.dateCriterion.value** | |
| Definition | Date recommendation |
| Control | 1..1 |
| Type | dateTime |
| **ImmunizationProfile.recommendation.protocol** | |
| Definition | Contains information about the protocol under which the vaccine was administered |
| Control | 0..1 |
| **ImmunizationProfile.recommendation.protocol.doseSequence** | |
| Definition | Nominal position in a series |
| Control | 0..1 |
| Type | integer |
| **ImmunizationProfile.recommendation.protocol.description** | |
| Definition | Contains the description about the protocol under which the vaccine was administered |
| Control | 0..1 |
| Type | string |
| **ImmunizationProfile.recommendation.protocol.authority** | |
| Definition | Indicates the authority who published the protocol? E.g. ACIP |
| Control | 0..1 |
| Type | Resource(Organization) |
| **ImmunizationProfile.recommendation.protocol.series** | |
| Definition | One possible path to achieve presumed immunity against a disease - within the context of an authority |
| Control | 0..1 |
| Type | string |
| **ImmunizationProfile.recommendation.supportingImmunization** | |
| Definition | Immunization event history that supports the status and recommendation |
| Control | 0..\* |
| Type | Resource(Immunization) |
| **ImmunizationProfile.recommendation.supportingAdverseEventReport** | |
| Definition | Adverse event report information that supports the status and recommendation |
| Control | 0..\* |
| **ImmunizationProfile.recommendation.supportingAdverseEventReport.identifier** | |
| Definition | Unique identifier of the adverse event report |
| Control | 1..\* |
| Type | id |
| **ImmunizationProfile.recommendation.supportingAdverseEventReport.reportType** | |
| Definition | Adverse event report classification |
| Control | 0..1 |
| Binding | AdverseEventReportType : Classifies an adverse event report |
| Type | CodeableConcept from AdverseEventReportType |
| **ImmunizationProfile.recommendation.supportingAdverseEventReport.reportDate** | |
| Definition | The date of the adverse event report |
| Control | 0..1 |
| Type | dateTime |
| **ImmunizationProfile.recommendation.supportingAdverseEventReport.text** | |
| Definition | The content of the adverse event report |
| Control | 0..1 |
| Type | string |
| **ImmunizationProfile.recommendation.supportingAdverseEventReport.reaction** | |
| Definition | The documented reaction described in the adverse event report |
| Control | 0..\* |
| Type | Resource(AdverseReaction) |
| **ImmunizationProfile.recommendation.supportingPatientObservation** | |
| Definition | Patient observation that supports the status and recommendation |
| Control | 0..\* |
| Type | Resource(Observation) |

## 5.27: Resource Formal Definitions: List

The formal definitions for the [List (§3.21)](http://hl7.org/implement/standards/fhir/fhir-book.htm#list) resource.

|  |  |
| --- | --- |
| **List** | |
| Definition | A set of information summarized from a list of other resources |
| Control | 1..1 |
| Aliases | Collection; WorkingList; Organizer |
| Invariants | **Defined on this element** **Inv-1**: A list can only have an emptyReason if it is empty (xpath: not(exists(f:emptyReason) and exists(f:entry))) **Inv-2**: The deleted flag can only be used if the (xpath: (f:mode/@value = 'changes') or not(exists(f:entry/f:item/f:deleted))) |
| To Do | RIM harmonization proposal to move LIST under GROUPER RIM harmonization proposal to allow organizers to group roles as well as acts. |
| **List.code** | |
| Definition | This code defines the purpose of the list - why it was created |
| Control | 0..1 |
| Binding | ListCode : What the purpose of a list is |
| Type | CodeableConcept from ListCode |
| Requirements | Lists often contain subsets of resources rather than an exhaustive list. The code identifies what type of subset is included |
| Comments | If there is no code, the purpose of the list is implied where it is used, such as in a document section using Document.section.code |
| **List.source** | |
| Definition | The entity responsible for deciding what the contents of the list were |
| Control | 0..1 |
| Type | Resource(Practitioner|Patient|Device) |
| Requirements | Allows follow-up as well as context |
| Comments | The primary and important source is the entity that made the decisions what items are in the list. This may be software or user |
| **List.date** | |
| Definition | The date that the list was prepared |
| Control | 0..1 |
| Type | dateTime |
| Requirements | Identifies how current the list is which affects relevance |
| Comments | The actual important date is the date of currency of the resources that were summarized, but it is usually assumed that these are current when the preparation occurs |
| **List.ordered** | |
| Definition | Whether items in the list have a meaningful order |
| Control | 0..1 |
| Type | boolean |
| Must Understand | true |
| Requirements | Important for presentation and rendering. Lists may be sorted to place more important information first or to group related entries. |
| Comments | Applications SHOULD render ordered lists in the order provided, but MAY allow users to re-order based on their own preferences as well. This is marked as "is modified" because whether the list is ordered or not has may change how the results are processed or displayed |
| **List.mode** | |
| Definition | How this list was prepared - whether it is a working list that is suitable for being maintained in an ongoing basis, or if it represents a snapshot of a list of items from another source, or whether it is a prepared list where items may be marked as added, modified or deleted |
| Control | 1..1 |
| Binding | ListMode : The processing mode that applies to this list (see [http://hl7.org/fhir/list-mode](http://hl7.org/implement/standards/fhir/fhir-book.htm#list-mode) for values) |
| Type | code from ListMode |
| Must Understand | true |
| Requirements | Lists are used in various ways, and it must be known in what way it is safe to use them |
| **List.entry** | |
| Definition | Entries in this list |
| Control | 0..\* |
| Comments | If there are no entries in the list, an emptyReason SHOULD be provided |
| Invariants | **Affect this element** **Inv-1**: A list can only have an emptyReason if it is empty (xpath: not(exists(f:emptyReason) and exists(f:entry))) |
| **List.entry.flag** | |
| Definition | The flag allows the system constructing the list to make one or more statements about the role and significance of the item in the list |
| Control | 0..\* |
| Binding | ListItemFlag : Codes that provide further information about the reason and meaning of the item in the list |
| Type | CodeableConcept from ListItemFlag |
| Requirements | This field is present to support various clinical uses of lists, such as a discharge summary medication list, where flags specify whether the medication was added, modified, or deleted from the list |
| Comments | The flag can only be understood in the context of the List.code. If the flag means that the entry has actually been deleted from the list, the deleted element must be true. Deleted can only be used if the List.mode is "changes" |
| **List.entry.deleted** | |
| Definition | True if this item is marked as deleted in the list. |
| Control | 0..1 |
| Type | boolean |
| Must Understand | true |
| Requirements | The flag element may contain codes that an application processing the list does not understand. However there can be no ambiguity if a list item is actually marked as "deleted" |
| Comments | If the flag means that the entry has actually been deleted from the list, the deleted element must be true. Both flag and deleted can only be used if the List.mode is "changes". A deleted entry should be displayed in narrative as deleted |
| Invariants | **Affect this element** **Inv-2**: The deleted flag can only be used if the (xpath: (f:mode/@value = 'changes') or not(exists(f:entry/f:item/f:deleted))) |
| **List.entry.date** | |
| Definition | When this item was added to the list |
| Control | 0..1 |
| Type | dateTime |
| Requirements | The date may be significant for understanding the meaning of items in a working list |
| Comments | This is only useful and meaningful when the mode is "working" |
| **List.entry.item** | |
| Definition | A reference to the actual resource from which data was derived |
| Control | 1..1 |
| Type | Resource(Any) |
| **List.emptyReason** | |
| Definition | If the list is empty, why the list is empty |
| Control | 0..1 |
| Binding | ListEmptyReason : If a list is empty, why it is empty |
| Type | CodeableConcept from ListEmptyReason |
| Requirements | Allows capturing things like "none exist" or "not asked" which can be important for most lists |
| Comments | The various reasons for an empty list make a significant interpretation to its interpretation |
| Invariants | **Affect this element** **Inv-1**: A list can only have an emptyReason if it is empty (xpath: not(exists(f:emptyReason) and exists(f:entry))) |

## 5.28: Resource Formal Definitions: Location

The formal definitions for the [Location (§3.22)](http://hl7.org/implement/standards/fhir/fhir-book.htm#location) resource.

|  |  |
| --- | --- |
| **Location** | |
| Definition | Contact details and position information for a physical place that may be visited and where healthcare resources and participants may be found or contained, accommodated, or stored |
| Control | 1..1 |
| **Location.name** | |
| Definition | Name of the location which identifies it to its users |
| Control | 1..1 |
| Type | string |
| Requirements | Organization label locations in registries, need to keep track of those |
| **Location.description** | |
| Definition | Description of the Location, which helps in finding or referencing the place |
| Control | 0..1 |
| Type | string |
| Requirements | Humans need additional information to verify a correct location has been identifier |
| **Location.type** | |
| Definition | Classification of the location |
| Control | 0..\* |
| Binding | LocationType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-location-type)) |
| Type | CodeableConcept from LocationType |
| Requirements | For purposes of showing relevant locations in queries, we need to categorize locations |
| Comments | There are many ways by which locations can be classified, so this element may be repeated. |
| **Location.telecom** | |
| Definition | The contact details of the main communication devices present at the location |
| Control | 0..1 |
| Type | Contact |
| **Location.address** | |
| Definition | Physical location |
| Control | 0..1 |
| Type | Address |
| Requirements | If locations can be visited, we need to keep track of their address |
| **Location.position** | |
| Definition | The absolute geographic location of the Location, expressed in a KML compatible manner |
| Control | 0..1 |
| Requirements | For mobile applications and automated route-finding knowing the exact location of the Location is required |
| **Location.position.longitude** | |
| Definition | Longitude. The value domain and the interpretation are the same as for the text of the longitude element in KML |
| Control | 1..1 |
| Type | decimal |
| **Location.position.latitude** | |
| Definition | Latitude. The value domain and the interpretation are the same as for the text of the latitude element in KML |
| Control | 1..1 |
| Type | decimal |
| **Location.position.altitude** | |
| Definition | Altitude. The value domain and the interpretation are the same as for the text of the altitude element in KML |
| Control | 0..1 |
| Type | decimal |
| **Location.provider** | |
| Definition | The organization that provides services at the location |
| Control | 0..1 |
| Type | Resource(Organization) |
| Requirements | Need to know who manages the location |
| To Do | EK: Shouldn't that be "owns or manages"? Why introduce the fact that an organization provides services here? If this is a home location, you wouldn't mention the organization(s) providing services there? |
| **Location.active** | |
| Definition | Whether the location is still used to provide services |
| Control | 0..1 |
| Type | boolean |
| Must Understand | true |
| **Location.partOf** | |
| Definition | Another Location which this Location is physically inside of |
| Control | 0..1 |
| Type | Resource(Location) |
| Requirements | For purposes of location, display and identification, knowing which locations are located within other locations is important |

## 5.29: Resource Formal Definitions: Media

The formal definitions for the [Media (§3.23)](http://hl7.org/implement/standards/fhir/fhir-book.htm#media) resource.

|  |  |
| --- | --- |
| **Media** | |
| Definition | A Photo, Video, or audio recording acquired or used in healthcare. The actual content maybe inline or provided by direct reference |
| Control | 1..1 |
| Invariants | **Defined on this element** **Inv-1**: Height can only be used for a photo or video (xpath: not(f:type/@value='audio') or not(f:height)) **Inv-2**: Width can only be used for a photo or video (xpath: not(f:type/@value='audio') or not(f:width)) **Inv-3**: Frames can only be used for a photo (xpath: (f:type/@value='photo') or not(f:frames)) **Inv-4**: Length can only be used for an audio or a video (xpath: not(f:type/@value='photo') or not(f:length)) |
| **Media.type** | |
| Definition | Whether the media is a photo (still image), an audio recording, or a video recording |
| Control | 1..1 |
| Binding | MediaType : Whether the Media is a photo, video, or audio (see [http://hl7.org/fhir/media-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#media-type) for values) |
| Type | code from MediaType |
| Summary | true |
| **Media.subtype** | |
| Definition | Details of the type of the media - usually, how it was acquired (what type of device). If images sourced from a DICOM system, are wrapped in a Media resource, then this is the modality |
| Control | 0..1 |
| Binding | MediaSubtype : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-subtype)) |
| Type | CodeableConcept from MediaSubtype |
| Summary | true |
| **Media.identifier** | |
| Definition | Identifiers associated with the image - these may include identifiers for the image itself, identifiers for the context of its collection (e.g. series ids) and context ids such as accession numbers or other workflow identifiers |
| Control | 0..\* |
| Type | Identifier |
| Summary | true |
| Comments | The identifier label and use can be used to determine what kind of identifier it is |
| **Media.dateTime** | |
| Definition | When the media was originally recorded. For video and audio, if the length of the recording is not insignificant, this is the end of the recording |
| Control | 0..1 |
| Type | dateTime |
| Summary | true |
| Comments | For an image including multiple frames, this is the start time |
| **Media.subject** | |
| Definition | Who/What this Media is a record of |
| Control | 0..1 |
| Type | Resource(Patient|Practitioner|Group|Device) |
| Summary | true |
| **Media.requester** | |
| Definition | Who requested that this image be collected |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Summary | true |
| Comments | Helps connect to workflow etc. |
| **Media.operator** | |
| Definition | The person who administered the collection of the image |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Summary | true |
| **Media.view** | |
| Definition | The name of the imaging view e.g. Lateral or Antero-posterior (AP). |
| Control | 0..1 |
| Binding | MediaView : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-media-view)) |
| Type | CodeableConcept from MediaView |
| Summary | true |
| **Media.deviceName** | |
| Definition | The name of the device / manufacturer of the device that was used to make the recording |
| Control | 0..1 |
| Type | string |
| Summary | true |
| **Media.height** | |
| Definition | Height of the image in pixels(photo/video) |
| Control | 0..1 |
| Type | integer |
| Summary | true |
| Invariants | **Affect this element** **Inv-1**: Height can only be used for a photo or video (xpath: not(f:type/@value='audio') or not(f:height)) |
| **Media.width** | |
| Definition | Width of the image in pixels (photo/video) |
| Control | 0..1 |
| Type | integer |
| Summary | true |
| Invariants | **Affect this element** **Inv-2**: Width can only be used for a photo or video (xpath: not(f:type/@value='audio') or not(f:width)) |
| **Media.frames** | |
| Definition | The number of frames in a photo. This is used with a multi-page fax, or an imaging acquisition context that takes multiple slices in a single image, or an animated gif. If there is more than one frame, this must have a value in order to alert interface software that a multi-frame capable rendering widget is required |
| Control | 0..1 |
| Type | integer |
| Summary | true |
| Invariants | **Affect this element** **Inv-3**: Frames can only be used for a photo (xpath: (f:type/@value='photo') or not(f:frames)) |
| **Media.length** | |
| Definition | The length of the recording in seconds - for audio and video |
| Control | 0..1 |
| Type | integer |
| Summary | true |
| Invariants | **Affect this element** **Inv-4**: Length can only be used for an audio or a video (xpath: not(f:type/@value='photo') or not(f:length)) |
| **Media.content** | |
| Definition | The actual content of the media - inline or by direct reference to the media source file |
| Control | 1..1 |
| Type | Attachment |
| Comments | Recommended content types: image/jpeg, image/png, image/tiff, video/mpeg, audio/mp4, application/dicom. Application/dicom can contain the transfer syntax as a parameter |

## 5.30: Resource Formal Definitions: Medication

The formal definitions for the [Medication (§3.24)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication) resource.

|  |  |
| --- | --- |
| **Medication** | |
| Definition | This is primarily for identification and definition of Medication, but also covers ingredients and packaging |
| Control | 1..1 |
| **Medication.name** | |
| Definition | The common name of the medication |
| Control | 0..1 |
| Type | string |
| Summary | true |
| **Medication.code** | |
| Definition | References to codes for this medication in standard medication terminologies, drug dictionaries, etc. |
| Control | 0..1 |
| Binding | MedicationCode : A code that defines the type of a medication |
| Type | CodeableConcept from MedicationCode |
| Summary | true |
| **Medication.isBrand** | |
| Definition | Set to true if the item is attributable to a specific manufacturer (even if we don't know who that is) |
| Control | 0..1 |
| Type | boolean |
| Summary | true |
| **Medication.manufacturer** | |
| Definition | Describes the details of the manufacturer |
| Control | 0..1 |
| Type | Resource(Organization) |
| Summary | true |
| **Medication.kind** | |
| Definition | product | package |
| Control | 0..1 |
| Binding | MedicationKind : Whether the medication is a product or a package (see [http://hl7.org/fhir/medication-kind](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-kind) for values) |
| Type | code from MedicationKind |
| Summary | true |
| **Medication.product** | |
| Definition | If is a product |
| Control | 0..1 |
| **Medication.product.form** | |
| Definition | Describes the form of the item. Powder; tables; carton |
| Control | 0..1 |
| Binding | MedicationForm : The form of a medication |
| Type | CodeableConcept from MedicationForm |
| **Medication.product.ingredient** | |
| Definition | The ingredients of the medication |
| Control | 0..\* |
| Comments | The ingredients need not be a complete list; usually only active ingredients are listed |
| **Medication.product.ingredient.item** | |
| Definition | The actual ingredient - either a substance (simple ingredient) or another medication |
| Control | 1..1 |
| Type | Resource(Substance|Medication) |
| **Medication.product.ingredient.amount** | |
| Definition | Specifies how many (or how much) of the items there are in this Medication. E.g. 250 mg per tablet |
| Control | 0..1 |
| Type | Ratio |
| **Medication.package** | |
| Definition | Specifies Ingredient / Product / Package |
| Control | 0..1 |
| **Medication.package.container** | |
| Definition | The kind of container that this package comes as |
| Control | 0..1 |
| Binding | MedicationContainer : Kind of container a medication package is packaged in |
| Type | CodeableConcept from MedicationContainer |
| **Medication.package.content** | |
| Definition | A set of components that go to make up the described item. |
| Control | 0..\* |
| **Medication.package.content.item** | |
| Definition | The product that is in the package |
| Control | 1..1 |
| Type | Resource(Medication) |
| **Medication.package.content.amount** | |
| Definition | The amount of the product that is in the package |
| Control | 0..1 |
| Type | Quantity |

## 5.31: Resource Formal Definitions: MedicationAdministration

The formal definitions for the [MedicationAdministration (§3.25)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationadministration) resource.

|  |  |
| --- | --- |
| **MedicationAdministration** | |
| Definition | Describes the event of a patient being given a dose of a medication. This may be as simple as swallowing a tablet or it may be a long running infusion. Related resources tie this event to the authorizing prescription, and the specific encounter between patient and health care practitioner |
| Control | 1..1 |
| **MedicationAdministration.identifier** | |
| Definition | External identifier - FHIR will generate its own internal IDs (probably URLs) which do not need to be explicitly managed by the resource. The identifier here is one that would be used by another non-FHIR system - for example an automated medication pump would provide a record each time it operated; an administration while the patient was off the ward might be made with a different system and entered after the event. Particularly important if these records have to be updated. |
| Control | 0..\* |
| Type | Identifier |
| **MedicationAdministration.status** | |
| Definition | Will generally be set to show that the administration has been completed. For some long running administrations such as infusions it is possible for an administration to be started but not completed or it may be paused while some other process is under way. |
| Control | 1..1 |
| Binding | MedicationAdministrationStatus : A set of codes indicating the current status of a MedicationAdministration (see [http://hl7.org/fhir/medication-admin-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-admin-status) for values) |
| Type | code from MedicationAdministrationStatus |
| **MedicationAdministration.patient** | |
| Definition | A link to a resource representing the person to whom the medication was given. |
| Control | 1..1 |
| Type | Resource(Patient) |
| **MedicationAdministration.practitioner** | |
| Definition | This is the individual who is responsible for giving the medication to the patient. |
| Control | 1..1 |
| Type | Resource(Practitioner) |
| **MedicationAdministration.encounter** | |
| Definition | An link to a resource that identifies the particular occurrence of contact between patient and health care provider. |
| Control | 0..1 |
| Type | Resource(Encounter) |
| **MedicationAdministration.prescription** | |
| Definition | A link to a resource that provides the original request, instruction and authority to perform the administration. |
| Control | 1..1 |
| Type | Resource(MedicationPrescription) |
| **MedicationAdministration.wasNotGiven** | |
| Definition | Set this to true if the record is saying that the medication was NOT administered. |
| Control | 0..1 |
| Type | boolean |
| **MedicationAdministration.reasonNotGiven** | |
| Definition | A code indicating why the administration has been negated. Use only if isNegated is set to TRUE |
| Control | 0..\* |
| Binding | MedicationAdministrationNegationReason : to be completed |
| Type | CodeableConcept from MedicationAdministrationNegationReason |
| **MedicationAdministration.whenGiven** | |
| Definition | An interval of time during which the administration takes place. For many administrations, such as swallowing a tablet the lower and upper values of the interval will be the same. |
| Control | 1..1 |
| Type | Period |
| **MedicationAdministration.medication** | |
| Definition | Identifies the medication being administered. This is either a link to a resource representing the details of the medication or a simple attribute carrying a code that identifies the medication from a known list of medications. |
| Control | 0..1 |
| Type | Resource(Medication) |
| **MedicationAdministration.administrationDevice** | |
| Definition | An identifier or a link to a resource that identifies a device used in administering the medication to the patient. |
| Control | 0..\* |
| Type | Resource(Device) |
| **MedicationAdministration.dosage** | |
| Definition | Indicates how the medication is to be used by the patient |
| Control | 0..\* |
| Invariants | **Defined on this element** **Inv-1**: Must have at least one of dosage.quantity and dosage.rate (xpath: exists(f:quantity) or exists(f:rate)) |
| **MedicationAdministration.dosage.timing** | |
| Definition | The timing schedule for giving the medication to the patient. The Schedule data type allows many different expressions, for example. "Every 8 hours"; "Three times a day"; "1/2 an hour before breakfast for 10 days from 23-Dec 2011:"; "15 Oct 2013, 17 Oct 2013 and 1 Nov 2013" |
| Control | 0..1 |
| Type | Schedule |
| **MedicationAdministration.dosage.site** | |
| Definition | A coded specification of the anatomic site where the medication first enters the body |
| Control | 0..1 |
| Binding | ApproachSite : to be completed |
| Type | CodeableConcept from ApproachSite |
| **MedicationAdministration.dosage.route** | |
| Definition | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. |
| Control | 0..1 |
| Binding | RouteOfAdministration : Dummy try out |
| Type | CodeableConcept from RouteOfAdministration |
| **MedicationAdministration.dosage.method** | |
| Definition | A coded value indicating the method by which the medication is introduced into or onto the body. Most commonly used for injections. Examples: Slow Push; Deep IV. Terminologies used often pre-coordinate this term with the route and or form of administration. |
| Control | 0..1 |
| Binding | MedicationAdministrationMethod : to be completed |
| Type | CodeableConcept from MedicationAdministrationMethod |
| **MedicationAdministration.dosage.quantity** | |
| Definition | The amount of the therapeutic or other substance given at one administration event. |
| Control | 0..1 |
| Type | Quantity |
| **MedicationAdministration.dosage.rate** | |
| Definition | Identifies the speed with which the substance is introduced into the subject. Typically the rate for an infusion. 200ml in 2 hours. |
| Control | 0..1 |
| Type | Ratio |
| **MedicationAdministration.dosage.maxDosePerPeriod** | |
| Definition | The maximum total quantity of a therapeutic substance that may be administered to a subject over the period of time. E.g. 1000mg in 24 hours. |
| Control | 0..1 |
| Type | Ratio |

## 5.32: Resource Formal Definitions: MedicationDispense

The formal definitions for the [MedicationDispense (§3.26)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationdispense) resource.

|  |  |
| --- | --- |
| **MedicationDispense** | |
| Definition | Dispensing a medication to a named patient. This includes a description of the supply provided and the instructions for administering the medication. |
| Control | 1..1 |
| **MedicationDispense.identifier** | |
| Definition | Identifier assigned by the dispensing facility - this is an identifier assigned outside FHIR. |
| Control | 0..1 |
| Type | Identifier |
| Must Understand | true |
| **MedicationDispense.status** | |
| Definition | A code specifying the state of the set of dispense events. |
| Control | 0..1 |
| Binding | MedicationDispenseStatus : A code specifying the state of the dispense event. (see [http://hl7.org/fhir/medication-dispense-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-dispense-status) for values) |
| Type | code from MedicationDispenseStatus |
| Must Understand | true |
| **MedicationDispense.patient** | |
| Definition | A link to a resource representing the person to whom the medication will be given. |
| Control | 0..1 |
| Type | Resource(Patient) |
| Comments | SubstanceAdministration->subject->Patient |
| **MedicationDispense.dispenser** | |
| Definition | The individual responsible for dispensing the medication |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| **MedicationDispense.authorizingPrescription** | |
| Definition | Indicates the medication order that is being dispensed against. |
| Control | 0..\* |
| Type | Resource(MedicationPrescription) |
| **MedicationDispense.dispense** | |
| Definition | Indicates the details of the dispense event such as the days supply and quantity of medication dispensed. |
| Control | 0..\* |
| Invariants | **Defined on this element** **Inv-1**: whenHandedOver cannot be before whenPrepared (xpath: not(exists(f:whenHandedOver/@value)) or not(exists(f:whenPrepared/@value)) or ( f:whenHandedOver/@value >= f:whenPrepared/@value)) |
| **MedicationDispense.dispense.identifier** | |
| Definition | Identifier assigned by the dispensing facility. This is an identifier assigned outside FHIR. |
| Control | 0..1 |
| Type | Identifier |
| **MedicationDispense.dispense.status** | |
| Definition | A code specifying the state of the dispense event. |
| Control | 0..1 |
| Binding | MedicationDispenseStatus : A code specifying the state of the dispense event. (see [http://hl7.org/fhir/medication-dispense-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-dispense-status) for values) |
| Type | code from MedicationDispenseStatus |
| Must Understand | true |
| **MedicationDispense.dispense.type** | |
| Definition | Indicates the type of dispensing event that is performed. Examples include: Trial Fill, Completion of Trial, Partial Fill, Emergency Fill, Samples, etc. |
| Control | 0..1 |
| Binding | MedicationDispenseType : to be completed |
| Type | CodeableConcept from MedicationDispenseType |
| **MedicationDispense.dispense.quantity** | |
| Definition | The amount of medication that has been dispensed. Includes unit of measure. |
| Control | 0..1 |
| Type | Quantity |
| **MedicationDispense.dispense.medication** | |
| Definition | Identifies the medication being administered. This is either a link to a resource representing the details of the medication or a simple attribute carrying a code that identifies the medication from a known list of medications. |
| Control | 0..1 |
| Type | Resource(Medication) |
| **MedicationDispense.dispense.whenPrepared** | |
| Definition | The time the dispense event occurred. |
| Control | 0..1 |
| Type | Period |
| **MedicationDispense.dispense.whenHandedOver** | |
| Definition | The time the dispense event occurred. |
| Control | 0..1 |
| Type | Period |
| **MedicationDispense.dispense.destination** | |
| Definition | Identification of the facility/location where the medication was shipped to, as part of the dispense event. |
| Control | 0..1 |
| Type | Resource(Location) |
| **MedicationDispense.dispense.receiver** | |
| Definition | Identifies the person who picked up the medication. |
| Control | 0..\* |
| Type | Resource(Practitioner) |
| **MedicationDispense.dispense.dosage** | |
| Definition | Indicates how the medication is to be used by the patient |
| Control | 0..\* |
| **MedicationDispense.dispense.dosage.additionalInstructions[x]** | |
| Definition | Additional instructions such as "Swallow with plenty of water" which may or may not be coded. |
| Control | 0..1 |
| Type | string|CodeableConcept |
| **MedicationDispense.dispense.dosage.timing[x]** | |
| Definition | The timing schedule for giving the medication to the patient. The Schedule data type allows many different expressions, for example. "Every 8 hours"; "Three times a day"; "1/2 an hour before breakfast for 10 days from 23-Dec 2011:"; "15 Oct 2013, 17 Oct 2013 and 1 Nov 2013" |
| Control | 0..1 |
| Type | dateTime|Period|Schedule |
| **MedicationDispense.dispense.dosage.site** | |
| Definition | A coded specification of the anatomic site where the medication first enters the body |
| Control | 0..1 |
| Binding | ApproachSite : to be completed |
| Type | CodeableConcept from ApproachSite |
| **MedicationDispense.dispense.dosage.route** | |
| Definition | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. |
| Control | 0..1 |
| Binding | RouteOfAdministration : Dummy try out |
| Type | CodeableConcept from RouteOfAdministration |
| **MedicationDispense.dispense.dosage.method** | |
| Definition | A coded value indicating the method by which the medication is introduced into or onto the body. Most commonly used for injections. Examples: Slow Push; Deep IV. Terminologies used often pre-coordinate this term with the route and or form of administration. |
| Control | 0..1 |
| Binding | MedicationAdministrationMethod : to be completed |
| Type | CodeableConcept from MedicationAdministrationMethod |
| Comments | SubstanceAdministration.methodCode |
| **MedicationDispense.dispense.dosage.quantity** | |
| Definition | The amount of the therapeutic or other substance given at one administration event. |
| Control | 0..1 |
| Type | Quantity |
| **MedicationDispense.dispense.dosage.rate** | |
| Definition | Identifies the speed with which the substance is introduced into the subject. Typically the rate for an infusion. 200ml in 2 hours. |
| Control | 0..1 |
| Type | Ratio |
| **MedicationDispense.dispense.dosage.maxDosePerPeriod** | |
| Definition | The maximum total quantity of a therapeutic substance that may be administered to a subject over the period of time. E.g. 1000mg in 24 hours. |
| Control | 0..1 |
| Type | Ratio |
| **MedicationDispense.substitution** | |
| Definition | Indicates whether or not substitution was made as part of the dispense. In some cases substitution will be expected but doesn't happen, in other cases substitution is not expected but does happen. This block explains what substitution did or did not happen and why. |
| Control | 0..1 |
| **MedicationDispense.substitution.type** | |
| Definition | A code signifying whether a different drug was dispensed from what was prescribed. |
| Control | 1..1 |
| Binding | MedicationDispenseSubstitutionType : to be completed |
| Type | CodeableConcept from MedicationDispenseSubstitutionType |
| **MedicationDispense.substitution.reason** | |
| Definition | Indicates the reason for the substitution of (or lack of substitution) from what was prescribed. |
| Control | 0..\* |
| Binding | MedicationDispenseSubstitutionReason : to be completed |
| Type | CodeableConcept from MedicationDispenseSubstitutionReason |
| **MedicationDispense.substitution.responsibleParty** | |
| Definition | The person or organization that has primary responsibility for the substitution |
| Control | 0..\* |
| Type | Resource(Practitioner) |
| Comments | rename |

## 5.33: Resource Formal Definitions: MedicationPrescription

The formal definitions for the [MedicationPrescription (§3.27)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationprescription) resource.

|  |  |
| --- | --- |
| **MedicationPrescription** | |
| Definition | An order for both supply of the medication and the instructions for administration of the medicine to a patient. |
| Control | 1..1 |
| **MedicationPrescription.identifier** | |
| Definition | External identifier - one that would be used by another non-FHIR system - for example a re-imbursement system might issue its own id for each prescription that is created. This is particularly important where FHIR only provides part of an entire workflow process where records have to be tracked through an entire system. |
| Control | 0..\* |
| Type | Identifier |
| Must Understand | true |
| **MedicationPrescription.dateWritten** | |
| Definition | The date (and perhaps time) when the prescription was written |
| Control | 0..1 |
| Type | dateTime |
| **MedicationPrescription.status** | |
| Definition | A code specifying the state of the order. Generally this will be active or completed state |
| Control | 0..1 |
| Binding | MedicationPrescriptionStatus : A code specifying the state of the prescribing event. (see [http://hl7.org/fhir/medication-prescription-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#medication-prescription-status) for values) |
| Type | code from MedicationPrescriptionStatus |
| Must Understand | true |
| **MedicationPrescription.patient** | |
| Definition | A link to a resource representing the person to whom the medication will be given. |
| Control | 0..1 |
| Type | Resource(Patient) |
| Comments | SubstanceAdministration->subject->Patient |
| **MedicationPrescription.prescriber** | |
| Definition | The healthcare professional responsible for authorising the prescription |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| **MedicationPrescription.encounter** | |
| Definition | A link to a resource that identifies the particular occurrence of contact between patient and health care provider. |
| Control | 0..1 |
| Type | Resource(Encounter) |
| Comments | SubstanceAdministration->component->EncounterEvent |
| **MedicationPrescription.reasonForPrescribing[x]** | |
| Definition | Can be the reason or the indication for writing the prescription. |
| Control | 0..1 |
| Type | string|CodeableConcept |
| **MedicationPrescription.medication** | |
| Definition | Identifies the medication being administered. This is either a link to a resource representing the details of the medication or a simple attribute carrying a code that identifies the medication from a known list of medications. |
| Control | 0..1 |
| Type | Resource(Medication) |
| **MedicationPrescription.dosageInstructions** | |
| Definition | Indicates how the medication is to be used by the patient |
| Control | 0..\* |
| **MedicationPrescription.dosageInstructions.dosageInstructionsText** | |
| Definition | Free text dosage instructions for cases where the instructions are too complex to code. |
| Control | 0..1 |
| Type | string |
| **MedicationPrescription.dosageInstructions.additionalInstructions[x]** | |
| Definition | Additional instructions such as "Swallow with plenty of water" which may or may not be coded. |
| Control | 0..1 |
| Type | string|CodeableConcept |
| **MedicationPrescription.dosageInstructions.timing[x]** | |
| Definition | The timing schedule for giving the medication to the patient. The Schedule data type allows many different expressions, for example. "Every 8 hours"; "Three times a day"; "1/2 an hour before breakfast for 10 days from 23-Dec 2011:"; "15 Oct 2013, 17 Oct 2013 and 1 Nov 2013" |
| Control | 0..1 |
| Type | dateTime|Period|Schedule |
| **MedicationPrescription.dosageInstructions.site** | |
| Definition | A coded specification of the anatomic site where the medication first enters the body |
| Control | 0..1 |
| Binding | ApproachSite : to be completed |
| Type | CodeableConcept from ApproachSite |
| **MedicationPrescription.dosageInstructions.route** | |
| Definition | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. |
| Control | 0..1 |
| Binding | RouteOfAdministration : Dummy try out |
| Type | CodeableConcept from RouteOfAdministration |
| **MedicationPrescription.dosageInstructions.method** | |
| Definition | A coded value indicating the method by which the medication is introduced into or onto the body. Most commonly used for injections. Examples: Slow Push; Deep IV. Terminologies used often pre-coordinate this term with the route and or form of administration. |
| Control | 0..1 |
| Binding | MedicationAdministrationMethod : to be completed |
| Type | CodeableConcept from MedicationAdministrationMethod |
| Comments | SubstanceAdministration.methodCode |
| **MedicationPrescription.dosageInstructions.doseQuantity** | |
| Definition | The amount of the therapeutic or other substance given at one administration event. |
| Control | 0..1 |
| Type | Quantity |
| **MedicationPrescription.dosageInstructions.rate** | |
| Definition | Identifies the speed with which the substance is introduced into the subject. Typically the rate for an infusion. 200ml in 2 hours. |
| Control | 0..1 |
| Type | Ratio |
| **MedicationPrescription.dosageInstructions.maxDosePerPeriod** | |
| Definition | The maximum total quantity of a therapeutic substance that may be administered to a subject over the period of time. E.g. 1000mg in 24 hours. |
| Control | 0..1 |
| Type | Ratio |
| **MedicationPrescription.dispense** | |
| Definition | Deals with details of the dispense part of the order |
| Control | 0..1 |
| **MedicationPrescription.dispense.medication** | |
| Definition | Identifies the medication that is to be dispensed. This may be a more specifically defined than the medicationPrescription.medication. This is either a link to a resource representing the details of the medication or a simple attribute carrying a code that identifies the medication from a known list of medications. |
| Control | 0..1 |
| Type | Resource(Medication) |
| **MedicationPrescription.dispense.validityPeriod** | |
| Definition | Design Comments: This indicates the validity period of a prescription (stale dating the Prescription) It reflects the prescriber perspective for the validity of the prescription. Dispenses must not be made against the prescription outside of this period. The lower-bound of the Dispensing Window signifies the earliest date that the prescription can be filled for the first time. If an upper-bound is not specified then the Prescription is open-ended or will default to a stale-date based on regulations. Rationale: Indicates when the Prescription becomes valid, and when it ceases to be a dispensable Prescription. |
| Control | 0..1 |
| Type | Period |
| To Do | Check v2 mapping |
| **MedicationPrescription.dispense.numberOfRepeatsAllowed** | |
| Definition | An integer indicating the number of repeats of the Dispense. Usage Notes: For example, the number of times the prescribed quantity is to be supplied including the initial standard fill. |
| Control | 0..1 |
| Type | integer |
| **MedicationPrescription.dispense.quantity** | |
| Definition | The amount that is to be dispensed. |
| Control | 0..1 |
| Type | Quantity |
| **MedicationPrescription.dispense.expectedSupplyDuration** | |
| Definition | Identifies the period time over which the supplied product is expected to be used, or the length of time the dispense is expected to last. In some situations, this attribute may be used instead of quantity to identify the amount supplied by how long it is expected to last, rather than the physical quantity issued. E.g. 90 days supply of medication (based on an ordered dosage) When possible, it is always better to specify quantity, as this tends to be more precise. expectedSupplyDuration will always be an estimate that can be influenced by external factors. |
| Control | 0..1 |
| Type | Duration |
| **MedicationPrescription.substitution** | |
| Definition | Indicates whether or not substitution can or should as part of the dispense. In some cases substitution must happen, in other cases substitution must not happen, and in others it does not matter. This block explains the prescribers intent. If nothing is specified substitution may be done. |
| Control | 0..1 |
| **MedicationPrescription.substitution.type** | |
| Definition | A code signifying whether a different drug should be dispensed from what was prescribed. |
| Control | 1..1 |
| Binding | MedicationIntendedSubstitutionType : to be completed |
| Type | CodeableConcept from MedicationIntendedSubstitutionType |
| **MedicationPrescription.substitution.reason** | |
| Definition | Indicates the reason for the substitution why substitution must or must not be performed. |
| Control | 0..1 |
| Binding | MedicationIntendedSubstitutionReason : to be completed |
| Type | CodeableConcept from MedicationIntendedSubstitutionReason |

## 5.34: Resource Formal Definitions: MedicationStatement

The formal definitions for the [MedicationStatement (§3.28)](http://hl7.org/implement/standards/fhir/fhir-book.htm#medicationstatement) resource.

|  |  |
| --- | --- |
| **MedicationStatement** | |
| Definition | A record of medication being taken by a patient, or that the medication has been given to a patient where the record is the result of a report from the patient, or another clinician |
| Control | 1..1 |
| Comments | SubstanceAdministration |
| **MedicationStatement.identifier** | |
| Definition | External identifier - FHIR will generate its own internal IDs (probably URLs) which do not need to be explicitly managed by the resource. The identifier here is one that would be used by another non-FHIR system - for example an automated medication pump would provide a record each time it operated; an administration while the patient was off the ward might be made with a different system and entered after the event. Particularly important if these records have to be updated. |
| Control | 0..\* |
| Type | Identifier |
| Must Understand | true |
| Comments | SubstanceAdministration.id |
| **MedicationStatement.patient** | |
| Definition | A link to a resource representing the person to whom the medication was given. |
| Control | 0..1 |
| Type | Resource(Patient) |
| Comments | SubstanceAdministration->subject->Patient |
| **MedicationStatement.wasNotGiven** | |
| Definition | Set this to true if the record is saying that the medication was NOT administered. |
| Control | 0..1 |
| Type | boolean |
| Comments | SubstanceAdministration.actionNegationInd |
| **MedicationStatement.reasonNotGiven** | |
| Definition | A code indicating why the administration has been negated. Use only if isNegated is set to TRUE |
| Control | 0..\* |
| Binding | MedicationAdministrationNegationReason : to be completed |
| Type | CodeableConcept from MedicationAdministrationNegationReason |
| Comments | SubstanceAdministration->Reason->Observation->Value |
| **MedicationStatement.whenGiven** | |
| Definition | An interval of time during which the administration takes place. For many administrations, such as swallowing a tablet the lower and upper values of the interval will be the same. |
| Control | 0..1 |
| Type | Period |
| Comments | SubstanceAdministration.effectiveTime |
| **MedicationStatement.medication** | |
| Definition | Identifies the medication being administered. This is either a link to a resource representing the details of the medication or a simple attribute carrying a code that identifies the medication from a known list of medications. |
| Control | 0..1 |
| Type | Resource(Medication) |
| **MedicationStatement.administrationDevice** | |
| Definition | An identifier or a link to a resource that identifies a device used in administering the medication to the patient. |
| Control | 0..\* |
| Type | Resource(Device) |
| Comments | SubstanceAdministration->device->Access OR SubstanceAdministration->device->AssignedDevice |
| **MedicationStatement.dosage** | |
| Definition | Indicates how the medication is to be used by the patient |
| Control | 0..\* |
| **MedicationStatement.dosage.timing** | |
| Definition | The timing schedule for giving the medication to the patient. The Schedule data type allows many different expressions, for example. "Every 8 hours"; "Three times a day"; "1/2 an hour before breakfast for 10 days from 23-Dec 2011:"; "15 Oct 2013, 17 Oct 2013 and 1 Nov 2013" |
| Control | 0..1 |
| Type | Schedule |
| **MedicationStatement.dosage.site** | |
| Definition | A coded specification of the anatomic site where the medication first enters the body |
| Control | 0..1 |
| Binding | ApproachSite : to be completed |
| Type | CodeableConcept from ApproachSite |
| **MedicationStatement.dosage.route** | |
| Definition | A code specifying the route or physiological path of administration of a therapeutic agent into or onto a subject. |
| Control | 0..1 |
| Binding | RouteOfAdministration : Dummy try out |
| Type | CodeableConcept from RouteOfAdministration |
| **MedicationStatement.dosage.method** | |
| Definition | A coded value indicating the method by which the medication is introduced into or onto the body. Most commonly used for injections. Examples: Slow Push; Deep IV. Terminologies used often pre-coordinate this term with the route and or form of administration. |
| Control | 0..1 |
| Binding | MedicationAdministrationMethod : to be completed |
| Type | CodeableConcept from MedicationAdministrationMethod |
| Comments | SubstanceAdministration.methodCode |
| **MedicationStatement.dosage.quantity** | |
| Definition | The amount of the therapeutic or other substance given at one administration event. |
| Control | 0..1 |
| Type | Quantity |
| **MedicationStatement.dosage.rate** | |
| Definition | Identifies the speed with which the substance is introduced into the subject. Typically the rate for an infusion. 200ml in 2 hours. |
| Control | 0..1 |
| Type | Ratio |
| **MedicationStatement.dosage.maxDosePerPeriod** | |
| Definition | The maximum total quantity of a therapeutic substance that may be administered to a subject over the period of time. E.g. 1000mg in 24 hours. |
| Control | 0..1 |
| Type | Ratio |

## 5.35: Resource Formal Definitions: Message

The formal definitions for the [Message (§2.3)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message) resource.

|  |  |
| --- | --- |
| **Message** | |
| Definition | A transmission requesting action on a bundle of one or more resources or a response to such a request |
| Control | 1..1 |
| Requirements | Many implementations are not prepared to use REST and need a message based infrastructure |
| **Message.identifier** | |
| Definition | The identifier of this message |
| Control | 1..1 |
| Type | id |
| Comments | This must be unique within the scope of this stream of messages |
| **Message.timestamp** | |
| Definition | The time that the message was sent |
| Control | 1..1 |
| Type | instant |
| Requirements | Allows limited detection of out-of-order and delayed transmission. Also supports audit. |
| **Message.event** | |
| Definition | Code that identifies the event this message represents and connects it with the event definition in the FHIR specification |
| Control | 1..1 |
| Binding | MessageEvent : the [Event List in the messaging framework (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#message-events) |
| Type | code from MessageEvent |
| Must Understand | true |
| Requirements | Drives the behavior associated with this message |
| To Do | Consider changing to Coding to support profile-defined events |
| **Message.response** | |
| Definition | Information about the message that this message is a response to. Only present if this message is a response. |
| Control | 0..1 |
| Must Understand | true |
| **Message.response.identifier** | |
| Definition | The id of the message that this a response to |
| Control | 1..1 |
| Type | id |
| Requirements | Allows receiver to know what message is being responded to |
| **Message.response.code** | |
| Definition | Code that identifies the type of response to the message - whether it was successful or not, and whether it should be resent or not |
| Control | 1..1 |
| Binding | ResponseCode : The kind of response to a message (see [http://hl7.org/fhir/response-code](http://hl7.org/implement/standards/fhir/fhir-book.htm#response-code) for values) |
| Type | code from ResponseCode |
| Must Understand | true |
| Requirements | Allows the sender of the acknowledge message to know if the request was successful or if action is needed. |
| Comments | This is a generic response to the request Message. Specific data for the response will be found in Message.data |
| **Message.response.details** | |
| Definition | Full details of any issues found in the message |
| Control | 0..1 |
| Type | Resource(OperationOutcome) |
| Requirements | Allows the sender of the message to determine what the specific issues are |
| Comments | This must be contained in the bundle. If any of the issues are errors, the response code must be an error |
| **Message.source** | |
| Definition | The source application from which this message originated |
| Control | 1..1 |
| Requirements | Allows replies, supports audit. |
| **Message.source.name** | |
| Definition | Human readable name for the target system |
| Control | 0..1 |
| Type | string |
| Requirements | May be used to support audit |
| **Message.source.software** | |
| Definition | May include configuration or other information useful in debugging. |
| Control | 1..1 |
| Type | string |
| Requirements | Supports audit and possibly interface engine behavior |
| **Message.source.version** | |
| Definition | Can convey versions of multiple systems in situations where a message passes through multiple hands. |
| Control | 0..1 |
| Type | string |
| Requirements | Supports audit and possibly interface engine behavior |
| **Message.source.contact** | |
| Definition | An e-mail, phone, website or other contact point to use to resolve issues with message communications. |
| Control | 0..1 |
| Type | Contact |
| Requirements | Allows escalation of technical issues. |
| **Message.source.endpoint** | |
| Definition | Identifies the routing target to send acknowledgements to. |
| Control | 1..1 |
| Type | uri |
| Requirements | Identifies where to send responses, may influence security permissions |
| Comments | The id may be a non-resolvable URI for systems that do not use standard network-based addresses |
| **Message.destination** | |
| Definition | The destination application which the message is intended for |
| Control | 1..1 |
| Requirements | Indicates where message is to be sent to for routing purposes. Allows verification of "am I the intended recipient" |
| **Message.destination.name** | |
| Definition | Human readable name for the source system |
| Control | 0..1 |
| Type | string |
| Requirements | May be used for routing of response and/or to support audit |
| **Message.destination.target** | |
| Definition | Identifies the target end system in situations where the initial message transmission is to an intermediary system. |
| Control | 0..1 |
| Type | Resource(Device) |
| Requirements | Supports multi-hop routing |
| **Message.destination.endpoint** | |
| Definition | Indicates where the message should be routed to. |
| Control | 1..1 |
| Type | uri |
| Requirements | Identifies where to route the message |
| Comments | The id may be a non-resolvable URI for systems that do not use standard network-based addresses |
| **Message.enterer** | |
| Definition | The person or device that performed the data entry leading to this Message. Where there is more than one candidate, pick the most proximal to the Message. Can provide other enterers in extensions |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Requirements | Need to know for audit/traceback requirements and possibly for authorization. |
| Comments | Usually only for the request, but can be used in a response |
| **Message.author** | |
| Definition | The logical author of the message - the person or device that decided the described event should happen. Where there is more than one candidate, pick the most proximal to the Message. Can provide other authors in extensions |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Requirements | Need to know for audit/traceback requirements and possibly for authorization. |
| Comments | Usually only for the request, but can be used in a response |
| **Message.receiver** | |
| Definition | Allows data conveyed by a message to be addressed to a particular person or department when routing to a specific application isn't sufficient. |
| Control | 0..1 |
| Type | Resource(Practitioner|Organization) |
| Requirements | Allows routing beyond just to the application level |
| **Message.responsible** | |
| Definition | The person or organization that accepts overall responsibility for the contents of the Message. The implication is that the message event happened under the policies of the responsible party |
| Control | 0..1 |
| Type | Resource(Practitioner|Organization) |
| Requirements | Need to know for audit/traceback requirements and possibly for authorization. |
| Comments | Usually only for the request, but can be used in a response |
| **Message.effective** | |
| Definition | The effective time - the real world time of the event that the message represents. Usually this is just a starting time, but some message events also have an end time (do x for period y) |
| Control | 0..1 |
| Type | Period |
| Requirements | Need to know for understanding the content of the message, may govern receiver's behavior. |
| Comments | Usually only for the request, but can be used in a response |
| To Do | Grahame thinks this is not 80/20. Also, that it really should be domain modeled, not tucked away here |
| **Message.reason** | |
| Definition | The cause of the event - a reason for the event that is a focus of this message occurred |
| Control | 0..1 |
| Binding | EventReason : The reason for an event occurring |
| Type | CodeableConcept from EventReason |
| Requirements | Need to be able to track why resources are being changed and report in the audit log / history of the resource. May affect authorization. |
| **Message.data** | |
| Definition | The actual data of the message - a reference to the root/focus class of the event. |
| Control | 0..\* |
| Type | Resource(Any) |
| Requirements | Every message event is about actual data, a single resource, that is identified in the definition of the event, and perhaps some or all linked resources |
| Comments | The data is defined where the transaction type is defined. The transaction data is always included in the bundle that is the full message. Only the root resource is specified. The tree of referenced resources conveyed in the atom feed is determined by navigating the tree and consulting the "bundled" property of the profile, not by listing all resources here. Multiple repetitions are provided for merges and other situations with multiple focal targets |

## 5.36: Resource Formal Definitions: Observation

The formal definitions for the [Observation (§3.29)](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation) resource.

|  |  |
| --- | --- |
| **Observation** | |
| Definition | Simple assertions and measurements made about a patient, device or other subject |
| Control | 1..1 |
| Requirements | Observations are a key aspect of healthcare. This resource is used to capture those that do not require more sophisticated mechanisms. |
| Aliases | Vital Signs |
| Comments | Used for simple observations such as device measures, laboratory atomic results, vital signs, height, weight, smoking status, comments, etc. Other resources are used to describe aggregate collections of observations such as Lab reports, etc. |
| Invariants | **Defined on this element** **Inv-1**: Must have at least one of value or components (xpath: exists(\*[starts-with(local-name(.), 'value')]) or exists(f:component)) **Inv-2**: Can only have normal range if value is a quantity (xpath: exists(f:valueQuantity) or not(exists(f:normalRange))) |
| **Observation.name** | |
| Definition | Identifies what type of observation was performed |
| Control | 1..1 |
| Binding | ObservationType : LOINC codes filtered to exclude panel codes ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-codes)) |
| Type | CodeableConcept from ObservationType |
| Requirements | Knowing what kind of observation is being made is essential to understanding the observation. |
| **Observation.value[x]** | |
| Definition | The information determined as a result of making the observation |
| Control | 0..1 |
| Type | Quantity|CodeableConcept|Attachment|Ratio|Choice|Period|SampledData|string |
| Requirements | A result with no value isn't much use. (Though an exceptional value such as 'unknown' may still be useful.) |
| Comments | The datatype for this element should be determined by Observation.name |
| **Observation.interpretation** | |
| Definition | The assessment made based on the result of the observation. |
| Control | 0..1 |
| Binding | ObservationInterpretation : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-interpretation)) |
| Type | CodeableConcept from ObservationInterpretation |
| Requirements | For some results, particularly numeric results, an interpretation is necessary to fully understand the significance of a result. |
| **Observation.comments** | |
| Definition | May include statements about significant, unexpected or unreliable. values, or information about the source of the value where this may be relevant to the interpretation of the result. |
| Control | 0..1 |
| Type | string |
| Requirements | Need to be able to provide free text additional information |
| **Observation.applies[x]** | |
| Definition | The time or time-period the observed value is asserted as being true. For biological subjects - e.g. human patients - this is usually called the "physiologically relevant time". |
| Control | 0..1 |
| Type | Period|dateTime |
| Requirements | Knowing when an observation was deemed true is important to its relevance as well as determining trends |
| Comments | At least a date should be present unless this observation is a historical report |
| **Observation.issued** | |
| Definition | Date/Time this was made available |
| Control | 0..1 |
| Type | instant |
| Comments | Updated when the result is updated |
| **Observation.status** | |
| Definition | The status of the result value |
| Control | 1..1 |
| Binding | ObservationStatus : Codes providing the status of an observation (see [http://hl7.org/fhir/observation-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) for values) |
| Type | code from ObservationStatus |
| Must Understand | true |
| Requirements | Need to track the status of individual results - some results are finalised before the whole report is finalised |
| **Observation.reliability** | |
| Definition | An estimate of the degree to which quality issues have impacted on the value reported |
| Control | 1..1 |
| Binding | ObservationReliability : Codes that provide reliability information about an observation (see [http://hl7.org/fhir/observation-reliability](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-reliability) for values) |
| Type | code from ObservationReliability |
| Must Understand | true |
| Requirements | Not all results are completely reliable, and some are still reported anyway. |
| Comments | Note that in most contexts, unreliable results are not recorded, deleted, or otherwise excluded, but this is not always done or possible. Interpreters of a result, whether human or machine, must always either be aware of the status, or prevented from seeing the observation if the reliability is not "ok" |
| **Observation.bodySite** | |
| Definition | Indicates where on the subject's body the observation was made. |
| Control | 0..1 |
| Binding | BodySite : SNOMED-CT Body site concepts ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site)) |
| Type | CodeableConcept from BodySite |
| Requirements | Knowing where observation is made is important for tracking if multiple sites are possible. |
| Comments | Only used if not implicit in code found in Observation.name |
| **Observation.method** | |
| Definition | Indicates the mechanism used to perform the observation |
| Control | 0..1 |
| Binding | ObservationMethod : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-methods)) |
| Type | CodeableConcept from ObservationMethod |
| Requirements | In some cases, method can impact results and is thus for determining whether results can be compared or determining significance of results |
| Comments | Only used if not implicit in code for SimpleObservation.result.type |
| **Observation.identifier** | |
| Definition | A unique identifier for the simple observation |
| Control | 0..1 |
| Type | Identifier |
| Requirements | Allows observations to be distinguished and referenced |
| **Observation.subject** | |
| Definition | The thing the observation is being made about |
| Control | 0..1 |
| Type | Resource(Patient|Group|Device) |
| Requirements | Observations have no value if you don't know who or what they're about. |
| Comments | The only circumstance in which the subject can be missing is when the observation is made by a device that does not know the patient. In this case, the observation must be matched to a patient through some context/channel matching technique, and at this point, the observation should be updated |
| **Observation.performer** | |
| Definition | Who was responsible for asserting the observed value as "true" |
| Control | 0..1 |
| Type | Resource(Practitioner|Device|Organization) |
| Requirements | May give a degree of confidence in the observation and also indicates where follow-up questions should be directed. |
| Comments | This would only be "Device" if the device is responsible for the measurement, not to capture the device used by a human to make the measurement. (The latter could be captured as an extension.) |
| **Observation.referenceRange** | |
| Definition | Guidance on how to interpret the value by comparison to a normal or recommended range |
| Control | 0..\* |
| Requirements | Knowing what values are considered "normal" can help evaluate the significance of a particular result. Need to be able to provide multiple reference ranges for different contexts |
| Comments | Most results only have one reference range, might be generic or be specific to the patient's age, gender, weight and other factors. When these things are not known, multiple reference ranges may be provided |
| **Observation.referenceRange.meaning** | |
| Definition | Code for the meaning of the reference range |
| Control | 0..1 |
| Binding | ObservationRangeMeaning : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-referencerange-meaning)) |
| Type | CodeableConcept from ObservationRangeMeaning |
| Requirements | Need to be able to say what kind of reference range this is - normal, recommended, therapeutic, or perhaps what state this reference range applies to (i.e. age, hormonal cycles, etc.) |
| Comments | This is only usually populated if there is more than one range |
| **Observation.referenceRange.range[x]** | |
| Definition | Actual value of the reference range. May be a quantity (<20mg/L), an range (10-20 umol/L), or some text |
| Control | 1..1 |
| Type | Quantity|Range|string |
| Requirements | Need to be able to report numerical or text reference ranges, and handle legacy data |
| Comments | Text reference ranges are typically used in endocrinology, or for legacy data with string reference ranges |
| **Observation.component** | |
| Definition | Component observation |
| Control | 0..\* |
| Requirements | Some observations such as blood pressure have multiple components. Components may also be used for supporting data such as distribution measures |
| Comments | It would be usual to either have a value or components with values, but both may be used, such as for APGAR scores |
| Invariants | **Affect this element** **Inv-1**: Must have at least one of value or components (xpath: exists(\*[starts-with(local-name(.), 'value')]) or exists(f:component)) |
| **Observation.component.name** | |
| Definition | Identifies what type of sub-observation was performed |
| Control | 1..1 |
| Binding | ObservationType : LOINC codes filtered to exclude panel codes ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-observation-codes)) |
| Type | CodeableConcept from ObservationType |
| Requirements | Knowing what kind of observation is being made is essential to understanding the observation. |
| **Observation.component.value[x]** | |
| Definition | The information determined as a result of making the sub-observation |
| Control | 1..1 |
| Type | Quantity|CodeableConcept|Attachment|Ratio|Choice|Period|SampledData|string |
| Requirements | A result with no value isn't much use. (Though an exceptional value such as 'unknown' may still be useful.) |
| Comments | The datatype for this element should be determined by Observation.name |

## 5.37: Resource Formal Definitions: OperationOutcome

The formal definitions for the [OperationOutcome (§3.30)](http://hl7.org/implement/standards/fhir/fhir-book.htm#operationoutcome) resource.

|  |  |
| --- | --- |
| **OperationOutcome** | |
| Definition | A collection of Error, warning or information messages that result from a system action |
| Control | 1..1 |
| Comments | Can result from the failure of a REST call or be part of the response message returned from a request message. If sent with extensions overriding particular issues, might even appear as part of a request message. |
| **OperationOutcome.issue** | |
| Definition | An error, warning or information message that results from a system action |
| Control | 1..\* |
| **OperationOutcome.issue.severity** | |
| Definition | Indicates whether the issue indicates a variation from successful processing |
| Control | 1..1 |
| Binding | IssueSeverity : How the issue affects the success of the action (see [http://hl7.org/fhir/issue-severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-severity) for values) |
| Type | code from IssueSeverity |
| Must Understand | true |
| Requirements | Indicates how relevant the issue is to the overall success of the action. |
| Comments | This is labelled as "Is Modifier" because applications should not confuse hints and warnings with errors |
| **OperationOutcome.issue.type** | |
| Definition | A code indicating the type of error, warning or information message. |
| Control | 0..1 |
| Binding | IssueType : A coded expression of the type of issue (see [http://hl7.org/fhir/issue-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#issue-type) for values) |
| Type | Coding from IssueType |
| Requirements | Expresses the issue in a computer-friendly way, allowing the requesting system to behave differently based on the type of issue. |
| Comments | Codes should only be defined at a level of granularity that reasonably allows distinct actions to be taken by the receiving system. If the response behavior of all systems is the same for two codes, the codes might as well be merged. The human-meaningful content of the issue is conveyed in .text. |
| To Do | Do we want to define an initial set of codes, or should we leave all of this to profiles? |
| **OperationOutcome.issue.details** | |
| Definition | Additional description of the issue |
| Control | 0..1 |
| Type | string |
| Comments | typically this field is used to provide details human readable information about the error |
| **OperationOutcome.issue.location** | |
| Definition | A simple XPath limited to element names, repetition indicators and the default child access that identifies one of the elements in the resource that caused this issue to be raised. |
| Control | 0..\* |
| Type | string |
| Requirements | Allows systems to highlight or otherwise guide users to elements implicated in issues to allow them to be fixed more easily. |
| Comments | The root of the XPath is the resource or bundle that generated OperationOutcome. Each XPath must resolve to a single node. The XPath syntax is used whether the referenced instance is expressed in XML or JSON. |

## 5.38: Resource Formal Definitions: Order

The formal definitions for the [Order (§3.31)](http://hl7.org/implement/standards/fhir/fhir-book.htm#order) resource.

|  |  |
| --- | --- |
| **Order** | |
| Definition | A request to perform an action |
| Control | 1..1 |
| Aliases | Request |
| **Order.date** | |
| Definition | When the order was made |
| Control | 0..1 |
| Type | dateTime |
| **Order.subject** | |
| Definition | Patient this order is about |
| Control | 0..1 |
| Type | Resource(Patient) |
| Aliases | Patient |
| Comments | May be left blank if the request reference identifies the patient, or if the request is not associated with a patient |
| **Order.source** | |
| Definition | Who initiated the order |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Aliases | Author; Practitioner |
| **Order.target** | |
| Definition | Who is intended to fulfill the order |
| Control | 0..1 |
| Type | Resource(Organization|Device) |
| **Order.reason** | |
| Definition | Text - why the order was made |
| Control | 0..1 |
| Type | string |
| **Order.authority** | |
| Definition | If required by policy |
| Control | 0..1 |
| Type | Resource(Any) |
| Comments | reference will be constrained when suitable targets exist |
| **Order.when** | |
| Definition | When order should be fulfilled |
| Control | 0..1 |
| Invariants | **Defined on this element** **Inv-1**: Provide a code or a schedule, but not both (xpath: exists(f:code) != exists(f:schedule)) |
| **Order.when.code** | |
| Definition | Code specifies when request should be done. The code may simply be a priority code |
| Control | 0..1 |
| Binding | RequestedTime : When a requested action should be performed |
| Type | CodeableConcept from RequestedTime |
| Comments | This is usually a local code agreed in the context of the ordering workflow |
| Invariants | **Affect this element** **Inv-1**: Provide a code or a schedule, but not both (xpath: exists(f:code) != exists(f:schedule)) |
| **Order.when.schedule** | |
| Definition | A formal schedule |
| Control | 0..1 |
| Type | Schedule |
| Invariants | **Affect this element** **Inv-1**: Provide a code or a schedule, but not both (xpath: exists(f:code) != exists(f:schedule)) |
| **Order.detail** | |
| Definition | What action is being ordered |
| Control | 1..\* |
| Type | Resource(Any) |

## 5.39: Resource Formal Definitions: OrderResponse

The formal definitions for the [OrderResponse (§3.32)](http://hl7.org/implement/standards/fhir/fhir-book.htm#orderresponse) resource.

|  |  |
| --- | --- |
| **OrderResponse** | |
| Definition | A Response to an order |
| Control | 1..1 |
| **OrderResponse.request** | |
| Definition | The order this is a response to |
| Control | 1..1 |
| Type | Resource(Order) |
| **OrderResponse.date** | |
| Definition | When the response was made |
| Control | 0..1 |
| Type | dateTime |
| **OrderResponse.who** | |
| Definition | Who made the response |
| Control | 0..1 |
| Type | Resource(Practitioner|Organization) |
| **OrderResponse.authority** | |
| Definition | If required by policy |
| Control | 0..1 |
| Type | Resource(Any) |
| Comments | reference will be constrained when suitable targets exist |
| **OrderResponse.cost** | |
| Definition | How much the request will/did cost |
| Control | 0..1 |
| Type | Money |
| **OrderResponse.code** | |
| Definition | The status of the response |
| Control | 1..1 |
| Binding | OrderOutcomeCode : The status of the response to an order (see [http://hl7.org/fhir/order-outcome-code](http://hl7.org/implement/standards/fhir/fhir-book.htm#order-outcome-code) for values) |
| Type | code from OrderOutcomeCode |
| Must Understand | true |
| **OrderResponse.description** | |
| Definition | Additional description of the response |
| Control | 0..1 |
| Type | string |
| **OrderResponse.fulfillment** | |
| Definition | Details of the outcome of performing the order |
| Control | 0..\* |
| Type | Resource(Any) |

## 5.40: Resource Formal Definitions: Organization

The formal definitions for the [Organization (§3.33)](http://hl7.org/implement/standards/fhir/fhir-book.htm#organization) resource.

|  |  |
| --- | --- |
| **Organization** | |
| Definition | A formally or informally recognized grouping of people or organizations formed for the purpose of achieving some form of collective action. Includes companies, institutions, corporations, departments, community groups, healthcare practice groups, etc. |
| Control | 1..1 |
| Invariants | **Defined on this element** **Inv-1**: The organization must at least have a name or and id, and possibly more (xpath: count(f:identifier | f:name) > 0) |
| **Organization.identifier** | |
| Definition | Identifier for the organization that is used to identify the organization across multiple disparate systems |
| Control | 0..\* |
| Type | Identifier |
| Requirements | Organizations are known by a variety of ids. Some institutions maintain several, and most collect identifiers for exchange with other organizations concerning the organization. |
| Invariants | **Affect this element** **Inv-1**: The organization must at least have a name or and id, and possibly more (xpath: count(f:identifier | f:name) > 0) |
| **Organization.name** | |
| Definition | A name associated with the organization |
| Control | 0..1 |
| Type | string |
| Requirements | Need to use the name as the label of the organization. |
| Invariants | **Affect this element** **Inv-1**: The organization must at least have a name or and id, and possibly more (xpath: count(f:identifier | f:name) > 0) |
| **Organization.type** | |
| Definition | The kind of organization that this is |
| Control | 0..1 |
| Binding | OrganizationType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-organization-type)) |
| Type | CodeableConcept from OrganizationType |
| Requirements | Need to be able to track the kind of organization that this is - different organization types have different uses |
| Comments | Organizations can be corporations, wards, sections, clinical teams, government departments, etc. Note that code is generally a classifier of the type of organization; in many applications, codes are used to identity a particular organization (say, ward) as opposed to another of the same type - these are identifiers, not codes |
| **Organization.telecom** | |
| Definition | A contact detail for the organization |
| Control | 0..\* |
| Type | Contact |
| Requirements | Human contact for the organization |
| Comments | The use code home is not to be used. Note that these contacts are not the contact details of people who are employed by or represent the organization, but official contacts for the organization itself |
| Invariants | **Defined on this element** **Inv-3**: The telecom of an organization can never be of use 'home' (xpath: count(f:use[@value='home']) = 0)**Affect this element** **Inv-3**: The telecom of an organization can never be of use 'home' (xpath: count(f:use[@value='home']) = 0) |
| **Organization.address** | |
| Definition | An address for the organization |
| Control | 0..\* |
| Type | Address |
| Requirements | May need to keep track of the organizations addresses for contacting, billing or reporting requirements |
| Comments | Organization may have multiple addresses with different uses or applicable periods. The use code home is not to be used |
| Invariants | **Defined on this element** **Inv-2**: An address of an organization can never be of use 'home' (xpath: count(f:use[@value='home']) = 0)**Affect this element** **Inv-2**: An address of an organization can never be of use 'home' (xpath: count(f:use[@value='home']) = 0) |
| **Organization.partOf** | |
| Definition | The organization of which this organization forms a part |
| Control | 0..1 |
| Type | Resource(Organization) |
| Requirements | Need to be able to track the hierarchy of organizations within an organization |
| **Organization.contact** | |
| Definition | Contact for the organization for a certain purpose |
| Control | 0..\* |
| Requirements | Need to keep track of assigned contact points within bigger organization |
| **Organization.contact.purpose** | |
| Definition | Indicates a purpose for which the contact can be reached |
| Control | 0..1 |
| Binding | ContactPartyType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-contactentity-type)) |
| Type | CodeableConcept from ContactPartyType |
| Requirements | Need to distinguish between multiple contact persons. |
| **Organization.contact.name** | |
| Definition | A name associated with the contact |
| Control | 0..1 |
| Type | HumanName |
| Requirements | Need to be able to track the person by name. |
| **Organization.contact.telecom** | |
| Definition | A contact detail (e.g. a telephone number or an email address) by which the party may be contacted. |
| Control | 0..\* |
| Type | Contact |
| Requirements | People have (primary) ways to contact them in some way such as phone, email. |
| **Organization.contact.address** | |
| Definition | Visiting or postal addresses for the contact |
| Control | 0..1 |
| Type | Address |
| Requirements | May need to keep track of a contact party's address for contacting, billing or reporting requirements |
| **Organization.contact.gender** | |
| Definition | Administrative Gender - the gender that the person is considered to have for administration and record keeping purposes. |
| Control | 0..1 |
| Binding | AdministrativeGender : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender)) |
| Type | CodeableConcept from AdministrativeGender |
| Requirements | Needed to address the person correctly |
| **Organization.active** | |
| Definition | Whether the organization's record is still in active use |
| Control | 0..1 |
| Type | boolean |
| Must Understand | true |
| Requirements | Need a flag to indicate a record is no longer to be used and should generally be hidden for the user in the UI. |
| Comments | Default is true. |

## 5.41: Resource Formal Definitions: Patient

The formal definitions for the [Patient (§3.34)](http://hl7.org/implement/standards/fhir/fhir-book.htm#patient) resource.

|  |  |
| --- | --- |
| **Patient** | |
| Definition | Demographics and other administrative information about a person or animal receiving care or other health-related services |
| Control | 1..1 |
| Requirements | Tracking patient is the center of the healthcare process |
| **Patient.identifier** | |
| Definition | An identifier that applies to this person as a patient |
| Control | 0..\* |
| Type | Identifier |
| Requirements | Patients are almost always assigned specific numerical identifiers |
| Summary | true |
| **Patient.name** | |
| Definition | A name associated with the individual. |
| Control | 0..\* |
| Type | HumanName |
| Requirements | Need to be able to track the person by multiple names. Examples are your official name and a partner name. |
| Summary | true |
| Comments | Person may have multiple names with different uses or applicable periods. For animals, the name is a "HumanName" in the sense that is assigned and used by humans and has the same patterns |
| **Patient.telecom** | |
| Definition | A contact detail (e.g. a telephone number or an email address) by which the individual may be contacted. |
| Control | 0..\* |
| Type | Contact |
| Requirements | People have (primary) ways to contact them in some way such as phone, email. |
| Summary | true |
| Comments | Person may have multiple ways to be contacted with different uses or applicable periods. May need to have options for contacting the person urgently and also to help with identification. The address may not go directly to the individual, but may reach another party that is able to proxy for the patient (i.e. home phone, or pet owner's phone) |
| **Patient.gender** | |
| Definition | Administrative Gender - the gender that the patient is considered to have for administration and record keeping purposes. |
| Control | 0..1 |
| Binding | AdministrativeGender : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender)) |
| Type | CodeableConcept from AdministrativeGender |
| Requirements | Needed for identification of the individual, in combination with (at least) name and birth date. Gender of individual drives many clinical processes. |
| Summary | true |
| Comments | The gender may not match the biological sex as determined by genetics, or the individual's preferred identification. Note that for both humans and particularly animals, there are other legitimate possibilities than M and F, though the vast majority of systems and contexts only support M and F |
| **Patient.birthDate** | |
| Definition | The date and time of birth for the individual |
| Control | 0..1 |
| Type | dateTime |
| Requirements | Age of the individual drives many clinical processes. Next to the common use case of capturing someone birth date, also in some common cases time is registered. |
| Summary | true |
| Comments | At least an estimated year should be provided as a guess if the real dob is unknown |
| **Patient.deceased[x]** | |
| Definition | Indicates if the individual is deceased or not |
| Control | 0..1 |
| Type | boolean|dateTime |
| Must Understand | true |
| Requirements | The fact that a patient is deceased influences the clinical process. Also, in human communication and relation management it is necessary to know whether the person is alive. |
| Summary | true |
| Comments | If there's no value in the instance it means there is no statement on whether or not the individual is deceased. Most systems will interpret the absence of a value as a sign of the person being alive. |
| **Patient.address** | |
| Definition | Addresses for the individual |
| Control | 0..\* |
| Type | Address |
| Requirements | May need to keep track of persons addresses for contacting, billing or reporting requirements and also to help with identification |
| Summary | true |
| Comments | Person may have multiple addresses with different uses or applicable periods |
| **Patient.maritalStatus** | |
| Definition | This field contains a patient's most recent marital (civil) status. |
| Control | 0..1 |
| Binding | MaritalStatus : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-marital-status)) |
| Type | CodeableConcept from MaritalStatus |
| Requirements | Most, if not all systems capture it. |
| Summary | true |
| **Patient.multipleBirth[x]** | |
| Definition | Indicates whether the patient is part of a multiple or indicates the actual birth order. |
| Control | 0..1 |
| Type | boolean|integer |
| Requirements | For disambiguation of multiple-birth children, especially relevant where the care provider doesn't meet the patient, such as labs. |
| Summary | true |
| **Patient.photo** | |
| Definition | Image of the person |
| Control | 0..\* |
| Type | Attachment |
| Requirements | Many EHR systems have the capability to capture an image of the patient. Fits with newer social media usage too. |
| **Patient.contact** | |
| Definition | A contact party (e.g. guardian, partner, friend) for the patient |
| Control | 0..\* |
| Requirements | Need to track people you can contact about the patient |
| Comments | Contact covers all kinds of contact parties: family members, business contacts, guardians, caregivers. Not applicable to register pedigree and family ties beyond use of having contact. |
| Invariants | **Defined on this element** **Inv-1**: Must at least contain a contact's details or a reference to an organization (xpath: f:name or f:telecom or f:address or f:organization) |
| **Patient.contact.relationship** | |
| Definition | The nature of the relationship between the patient and the contactperson |
| Control | 0..\* |
| Binding | ContactRelationship : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-patient-contact-relationship)) |
| Type | CodeableConcept from ContactRelationship |
| Requirements | Used to determine which contactperson is most relevant approach, depending on circumstances |
| **Patient.contact.name** | |
| Definition | A name associated with the person |
| Control | 0..1 |
| Type | HumanName |
| Requirements | Contact persons need to be identified by name, but it is uncommon to need details about multiple other names for that person |
| **Patient.contact.telecom** | |
| Definition | A contact detail for the person, e.g. a telephone number or an email address. |
| Control | 0..\* |
| Type | Contact |
| Requirements | People have (primary) ways to contact them in some way such as phone, email. |
| Comments | Person may have multiple ways to be contacted with different uses or applicable periods. May need to have options for contacting the person urgently, and also to help with identification |
| **Patient.contact.address** | |
| Definition | Address for the contact person |
| Control | 0..1 |
| Type | Address |
| Requirements | Need to keep track where the contact person can be contacted per postal mail or visited |
| **Patient.contact.gender** | |
| Definition | Administrative Gender - the gender that the person is considered to have for administration and record keeping purposes. |
| Control | 0..1 |
| Binding | AdministrativeGender : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender)) |
| Type | CodeableConcept from AdministrativeGender |
| Requirements | Needed to address the person correctly |
| **Patient.contact.organization** | |
| Definition | Organization on behalf of which the contact is acting or for which the contact is working. |
| Control | 0..1 |
| Type | Resource(Organization) |
| Requirements | For guardians or business related contacts, the organization is relevant |
| Invariants | **Affect this element** **Inv-1**: Must at least contain a contact's details or a reference to an organization (xpath: f:name or f:telecom or f:address or f:organization) |
| **Patient.animal** | |
| Definition | This element has a value if the patient is an animal |
| Control | 0..1 |
| Must Understand | true |
| Requirements | Many clinical systems are extended to care for animal patients as well as human |
| Summary | true |
| Comments | The animal element is labelled "Is Modifier" since patients may be non-human. Systems must either handle patient details appropriately (e.g. inform users patient is not human) or reject non-human patient records |
| **Patient.animal.species** | |
| Definition | Identifies the high level categorization of the kind of animal |
| Control | 1..1 |
| Binding | AnimalSpecies : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-species)) |
| Type | CodeableConcept from AnimalSpecies |
| Requirements | Need to know what kind of animal |
| Summary | true |
| Comments | If the patient is non-human, at least a species must be specified |
| To Do | PID.35 |
| **Patient.animal.breed** | |
| Definition | Identifies the detailed categorization of the kind of animal. |
| Control | 0..1 |
| Binding | AnimalBreed : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-breeds)) |
| Type | CodeableConcept from AnimalBreed |
| Requirements | May need to know the specific kind within the species |
| Summary | true |
| To Do | PID.37 |
| **Patient.animal.genderStatus** | |
| Definition | Indicates the current state of the animal's reproductive organs |
| Control | 0..1 |
| Binding | AnimalGenderStatus : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-animal-genderstatus)) |
| Type | CodeableConcept from AnimalGenderStatus |
| Requirements | Gender status can affect housing and animal behavior |
| Summary | true |
| To Do | N/A |
| **Patient.communication** | |
| Definition | Languages which may be used to communicate with the patient |
| Control | 0..\* |
| Binding | Language : see [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |
| Type | CodeableConcept from Language |
| Requirements | If a patient does not speak the local language, interpreters may be required, so languages spoken is an important things to keep track of both for patient and other persons of interest |
| Comments | If no language is specified, this \*implies\* that the default local language is spoken. For animals, language is not a relevant field, and should be absent from the instance |
| **Patient.provider** | |
| Definition | The provider for whom this is a patient record |
| Control | 0..1 |
| Type | Resource(Organization) |
| Requirements | Need to know who recognises this patient record |
| Summary | true |
| **Patient.link** | |
| Definition | A linked patient resource is a resource that concerns the same patient. Resources are linked after it is realized that at least one was created in error. |
| Control | 0..\* |
| Type | Resource(Patient) |
| Must Understand | true |
| Requirements | Due to the clerical errors associated with the difficulties of identifying humans consistently, duplicate patient records are frequently created in error |
| Summary | true |
| Comments | More than two patient resources may be linked. Note that there is a special transaction for linking patient resources in the RESTful context, as resource linking consistency must be maintained |
| **Patient.active** | |
| Definition | Whether this patient record is in active use |
| Control | 0..1 |
| Type | boolean |
| Must Understand | true |
| Requirements | Need to be able to mark a patient record as not to be used because it was created in error |
| Summary | true |
| Comments | Default is true. If a record is inactive, and linked to an active record, then future patient/person/record updates should occur on the other patient |

## 5.42: Resource Formal Definitions: Picture

The formal definitions for the [Picture (§3.35)](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture) resource.

|  |  |
| --- | --- |
| **Picture** | |
| Definition | An Image used in healthcare. The actual pixels maybe inline or provided by direct reference |
| Control | 1..1 |
| **Picture.subject** | |
| Definition | Who/What this image is taken of |
| Control | 0..1 |
| Type | Resource(Patient|Group|Device) |
| Summary | true |
| **Picture.dateTime** | |
| Definition | When the image was taken |
| Control | 0..1 |
| Type | dateTime |
| Summary | true |
| Comments | For an image including multiple frames, this is the start time |
| **Picture.operator** | |
| Definition | The person who generated the image |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Summary | true |
| **Picture.identifier** | |
| Definition | Identifier for the image |
| Control | 0..1 |
| Type | Identifier |
| Summary | true |
| **Picture.accessionNo** | |
| Definition | An identifier for the order that is used by the application/system that requested the image to link back to the original context (if there was such a system). This is not the identity of the image, but of the "request for an image to be generated" |
| Control | 0..1 |
| Type | Identifier |
| Summary | true |
| Comments | The name "Accession Number" comes from DICOM, where it is used ubiquitously |
| **Picture.studyId** | |
| Definition | The session in which the picture was taken. |
| Control | 0..1 |
| Type | Identifier |
| Summary | true |
| Comments | Usually used for DICOM images |
| **Picture.seriesId** | |
| Definition | The series of images in which this picture was taken |
| Control | 0..1 |
| Type | Identifier |
| Summary | true |
| Comments | Usually used for DICOM images |
| **Picture.method** | |
| Definition | A reference to the method/protocol that was followed when the images were taken |
| Control | 0..1 |
| Type | CodeableConcept |
| Summary | true |
| **Picture.requester** | |
| Definition | Who asked that this image be collected |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Summary | true |
| **Picture.modality** | |
| Definition | Type of the image capturing machinery |
| Control | 1..1 |
| Binding | PictureType : The type of image in the picture (see [http://hl7.org/fhir/picture-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#picture-type) for values) |
| Type | code from PictureType |
| Summary | true |
| **Picture.deviceName** | |
| Definition | Name of the manufacturer |
| Control | 0..1 |
| Type | string |
| Summary | true |
| **Picture.height** | |
| Definition | Height of the image |
| Control | 0..1 |
| Type | integer |
| Summary | true |
| **Picture.width** | |
| Definition | Width of the image |
| Control | 0..1 |
| Type | integer |
| Summary | true |
| **Picture.bits** | |
| Definition | Number of bits of colour (2..32) |
| Control | 0..1 |
| Type | integer |
| Summary | true |
| **Picture.frames** | |
| Definition | Number of frames |
| Control | 0..1 |
| Type | integer |
| Summary | true |
| **Picture.frameDelay** | |
| Definition | Length of time between frames |
| Control | 0..1 |
| Type | Duration |
| Summary | true |
| Comments | a value of 0 indicates that the frames are not a sequence of time separated images |
| **Picture.view** | |
| Definition | The name of the imaging view e.g. Lateral or Antero-posterior (AP). |
| Control | 0..1 |
| Type | CodeableConcept |
| Summary | true |
| **Picture.content** | |
| Definition | Actual picture - reference or data |
| Control | 1..1 |
| Type | Attachment |
| Comments | Recommended content types: image/jpeg, image/png, application/dicom. Application/dicom can contain the transfer syntax as a parameter |

## 5.43: Resource Formal Definitions: Practitioner

The formal definitions for the [Practitioner (§3.36)](http://hl7.org/implement/standards/fhir/fhir-book.htm#practitioner) resource.

|  |  |
| --- | --- |
| **Practitioner** | |
| Definition | Demographics and qualification information for an individual who is directly or indirectly involved in the provisioning of healthcare |
| Control | 1..1 |
| Requirements | Need to track doctors, staff, locums etc. for both healthcare practitioners, funders, etc. |
| Comments | Note that a cab driver no longer fits the bill. You probably would be interested in the organization rather than the individual? |
| **Practitioner.identifier** | |
| Definition | An identifier that applies to this person in this role |
| Control | 0..\* |
| Type | Identifier |
| Requirements | Often, specific identities are assigned for the agent |
| Summary | true |
| Comments | The identifier changes when a new/different person steps into the same role |
| **Practitioner.name** | |
| Definition | A name associated with the person |
| Control | 0..1 |
| Type | HumanName |
| Requirements | Contact persons need to be identified by name, but it is uncommon to need details about multiple other names for that person |
| Summary | true |
| **Practitioner.telecom** | |
| Definition | A contact detail for the practitioner, e.g. a telephone number or an email address. |
| Control | 0..\* |
| Type | Contact |
| Requirements | Need to know how to reach a practitioner |
| Summary | true |
| Comments | Person may have multiple ways to be contacted with different uses or applicable periods. May need to have options for contacting the person urgently, and also to help with identification |
| **Practitioner.address** | |
| Definition | One or more addresses where the practitioner can be found or visited |
| Control | 0..1 |
| Type | Address |
| Requirements | Need to keep track where the practitioner can found during work or for directing mail |
| Summary | true |
| **Practitioner.gender** | |
| Definition | Administrative Gender - the gender that the person is considered to have for administration and record keeping purposes. |
| Control | 0..1 |
| Binding | AdministrativeGender : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender)) |
| Type | CodeableConcept from AdministrativeGender |
| Requirements | Needed to address the person correctly |
| Summary | true |
| **Practitioner.birthDate** | |
| Definition | The date and time of birth for the practitioner |
| Control | 0..1 |
| Type | dateTime |
| Requirements | Needed for identification |
| Summary | true |
| **Practitioner.photo** | |
| Definition | Image of the person |
| Control | 0..\* |
| Type | Attachment |
| Requirements | Many EHR systems have the capability to capture an image of patients and personnel. Fits with newer social media usage too. |
| **Practitioner.organization** | |
| Definition | The organisation that the practitioner represents |
| Control | 0..1 |
| Type | Resource(Organization) |
| Requirements | Need to be able to track the represented organisation separately, if any. |
| Summary | true |
| **Practitioner.role** | |
| Definition | The way in which the person represents the organisation - what role do they have? |
| Control | 0..\* |
| Binding | PractitionerRole : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-role)) |
| Type | CodeableConcept from PractitionerRole |
| Requirements | Need to know what authority the practitioner has - what can they do? |
| Summary | true |
| Comments | A person may have more than one role. At least one role is required. |
| To Do | We have de-emphasized the organisation. So is this no longer the "role" within the organization? |
| **Practitioner.specialty** | |
| Definition | Specific specialty of the practitioner |
| Control | 0..\* |
| Binding | PractitionerSpecialty : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-practitioner-specialty)) |
| Type | CodeableConcept from PractitionerSpecialty |
| Summary | true |
| **Practitioner.period** | |
| Definition | The period during which the person is authorized to perform the service |
| Control | 0..1 |
| Type | Period |
| Requirements | Qualifications are often for a limited period of time, and can be revoked. Even after the agencies is revoked, the fact that it existed must still be recorded |
| Summary | true |
| To Do | Is this separate from the period of validity of the qualification? |
| **Practitioner.qualification** | |
| Definition | Qualifications relevant to the provided service |
| Control | 0..\* |
| **Practitioner.qualification.code** | |
| Definition | Coded representation of the qualification |
| Control | 1..1 |
| Binding | Qualification : Specific qualification the practitioner has to provide a service |
| Type | CodeableConcept from Qualification |
| **Practitioner.qualification.period** | |
| Definition | Period during which the qualification is valid |
| Control | 0..1 |
| Type | Period |
| **Practitioner.qualification.issuer** | |
| Definition | Organization that regulates and issues the qualification |
| Control | 0..1 |
| Type | Resource(Organization) |
| **Practitioner.communication** | |
| Definition | A language the practitioner is able to use in patient communication |
| Control | 0..\* |
| Binding | Language : see [IETF language tag (http://tools.ietf.org/html/bcp47)](http://tools.ietf.org/html/bcp47) |
| Type | CodeableConcept from Language |
| Requirements | Knowing which language a practitioner speaks can help in facilitating communication with patients |
| Comments | The structure aa-BB with this exact casing is one the most widely used notations for locale. However not all systems actually code this but instead have it as free text. Hence CodeableConcept instead of code as the data type |
| To Do | Note: cannot be named "language" because of technical reasons |

## 5.44: Resource Formal Definitions: Procedure

The formal definitions for the [Procedure (§3.37)](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure) resource.

|  |  |
| --- | --- |
| **Procedure** | |
| Definition | An action that is performed on a patient. This can be a physical 'thing' like an operation, or less invasive like counselling or hypnotherapy |
| Control | 1..1 |
| **Procedure.subject** | |
| Definition | The person on whom the procedure was performed |
| Control | 1..1 |
| Type | Resource(Patient) |
| Summary | true |
| **Procedure.type** | |
| Definition | The specific procedure that is performed |
| Control | 0..1 |
| Type | CodeableConcept |
| Summary | true |
| **Procedure.bodySite** | |
| Definition | Detailed and structured anatomical location information. Multiple locations are allowed - eg multiple punch biopsies of a lesion |
| Control | 0..\* |
| Type | CodeableConcept |
| Summary | true |
| **Procedure.indication** | |
| Definition | The reason why the procedure was performed. This may be due to a Condition, may be coded entity of some type, or may simply be present as text |
| Control | 0..1 |
| Type | string |
| Summary | true |
| **Procedure.performer** | |
| Definition | This is limited to 'real' people rather than equipment |
| Control | 0..\* |
| Summary | true |
| **Procedure.performer.person** | |
| Definition | The practitioner who was involved in the procedure |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| Summary | true |
| **Procedure.performer.role** | |
| Definition | E.g. surgeon, anaesthetist, endoscopist |
| Control | 0..1 |
| Type | CodeableConcept |
| Summary | true |
| **Procedure.date** | |
| Definition | The dates over which the period was performed. Allows a period to support complex procedures that span more than one date, and also allows for the length of the procedure to be captured. |
| Control | 0..1 |
| Type | Period |
| Summary | true |
| **Procedure.encounter** | |
| Definition | The encounter during which the procedure was performed |
| Control | 0..1 |
| Type | Resource(Encounter) |
| Summary | true |
| **Procedure.outcome** | |
| Definition | What was the outcome of the procedure - did it resolve reasons why the procedure was performed? |
| Control | 0..1 |
| Type | string |
| Summary | true |
| **Procedure.report** | |
| Definition | This could be a histology result. There could potentially be multiple reports - eg if this was a procedure that made multiple biopsies |
| Control | 0..\* |
| Type | Resource(DiagnosticReport) |
| **Procedure.complication** | |
| Definition | Any complications that occurred during the procedure, or in the immediate post-operative period. These are generally tracked separately from the notes, which typically will describe the procedure itself rather than any 'post procedure' issues |
| Control | 0..1 |
| Type | string |
| **Procedure.followUp** | |
| Definition | If the procedure required specific follow up - eg removal of sutures. The follow-up may be represented as a simple note, or potentially could be more complex in which case the CarePlan resource can be used |
| Control | 0..1 |
| Type | string |
| **Procedure.relatedItem** | |
| Definition | Procedures may be related to other items such as procedures or medications. For example treating wound dehiscence following a previous procedure |
| Control | 0..\* |
| **Procedure.relatedItem.type** | |
| Definition | The nature of the relationship |
| Control | 0..1 |
| Binding | ProcedureRelationshipType : the nature of the relationship (see [http://hl7.org/fhir/procedure-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#procedure-relationship-type) for values) |
| Type | code from ProcedureRelationshipType |
| **Procedure.relatedItem.target** | |
| Definition | The related item - eg a procedure |
| Control | 0..1 |
| Type | Resource(Procedure|MedicationPrescription) |
| **Procedure.notes** | |
| Definition | Any other notes about the procedure - eg the operative notes |
| Control | 0..1 |
| Type | string |

## 5.45: Resource Formal Definitions: Profile

The formal definitions for the [Profile (§3.38)](http://hl7.org/implement/standards/fhir/fhir-book.htm#profile) resource.

|  |  |
| --- | --- |
| **Profile** | |
| Definition | A Resource Profile - a statement of use of one or more FHIR Resources. It may include constraints on Resources and Data Types, Terminology Binding Statements and Extension Definitions |
| Control | 1..1 |
| Aliases | Template |
| Comments | Often called a clinical template |
| Invariants | **Defined on this element** **Inv-8**: Must define at least one resource constraint, extension definition or binding (xpath: exists(f:structure) or exists(f:extensionDefn) or exists(f:binding)) |
| **Profile.identifier** | |
| Definition | The identifier that is used to identify this profile when it is referenced in a specification, model, design or an instance (should be globally unique OID, UUID, or URI) |
| Control | 0..1 |
| Type | string |
| Summary | true |
| Comments | N/A |
| **Profile.version** | |
| Definition | The identifier that is used to identify this version of the profile when it is referenced in a specification, model, design or instance. This is an arbitrary value managed by the profile author manually and the value should be a timestamp |
| Control | 0..1 |
| Type | string |
| Requirements | There may be multiple resource versions of the profile that have this same identifier. The resource version id will change for technical reasons, whereas the stated version number needs to be under the author's control |
| Summary | true |
| Comments | N/A |
| **Profile.name** | |
| Definition | A free text natural language name identifying the Profile |
| Control | 1..1 |
| Type | string |
| Summary | true |
| Comments | Not expected to be globally unique |
| **Profile.publisher** | |
| Definition | Details of the individual or organization who accepts responsibility for publishing the profile |
| Control | 0..1 |
| Type | string |
| Requirements | Helps establish the "authority/credibility" of the profile. May also allow for contact |
| Summary | true |
| Comments | Usually an organization, but may be an individual. This item SHOULD be populated unless the information is available from context. |
| **Profile.telecom** | |
| Definition | Contact details to assist a user in finding and communicating with the publisher |
| Control | 0..\* |
| Type | Contact |
| Summary | true |
| Comments | May be a web site, an email address, a telephone number (tel:), etc. |
| **Profile.description** | |
| Definition | A free text natural language description of the profile and its use |
| Control | 0..1 |
| Type | string |
| Summary | true |
| Comments | This field can be used for things such as why the profile was written, comments about misuse, instructions for clinical use and interpretation, literature references, examples from the paper world, etc. It is \*not\* a rendering of the profile as conveyed in Profile.text. This item SHOULD be populated unless the information is available from context. |
| **Profile.code** | |
| Definition | A set of terms from external terminologies that may be used to assist with indexing and searching of templates. |
| Control | 0..\* |
| Type | Coding |
| Requirements | Assist in searching for appropriate profiles |
| Summary | true |
| **Profile.status** | |
| Definition | The status of the profile |
| Control | 1..1 |
| Binding | ResourceProfileStatus : The lifecycle status of a Resource Profile (see [http://hl7.org/fhir/resource-profile-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-profile-status) for values) |
| Type | code from ResourceProfileStatus |
| Must Understand | true |
| Requirements | Allows filtering of profiles that are appropriate for use vs. not |
| Summary | true |
| **Profile.experimental** | |
| Definition | This profile was authored for testing purposes (or education/evaluation/marketing), and is not intended to be used for genuine usage |
| Control | 0..1 |
| Type | boolean |
| Requirements | Allows filtering of profiles that are appropriate for use vs. not |
| Summary | true |
| **Profile.date** | |
| Definition | The date that this version of the profile was published |
| Control | 0..1 |
| Type | dateTime |
| Summary | true |
| **Profile.fhirVersion** | |
| Definition | The version of the FHIR specification on which this profile is based |
| Control | 0..1 |
| Type | id |
| Summary | true |
| Comments | A profile does not need to specify the target it applies to, as profiles will often be valid across multiple versions of FHIR. FHIR tooling can determine whether a profile is consistent with a particular profile if desired |
| **Profile.structure** | |
| Definition | A constraint statement about what contents a resource or data type may have |
| Control | 0..\* |
| Invariants | **Defined on this element** **Inv-1**: Provide either a profile reference or constraints on the resource elements (but not both) (xpath: exists(f:profile) != exists(f:element)) **Inv-12**: Only complex types can be constrained, not primitive types such as string etc. (xpath: upper-case(substring(f:type,1,1))=substring(f:type,1,1))**Affect this element** **Inv-8**: Must define at least one resource constraint, extension definition or binding (xpath: exists(f:structure) or exists(f:extensionDefn) or exists(f:binding)) |
| To Do | Consider adding elements to support capturing events |
| **Profile.structure.type** | |
| Definition | The Resource or Data type being described |
| Control | 1..1 |
| Binding | FHIRDefinedType : [Any defined Resource or Data Type name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#defined-types) |
| Type | code from FHIRDefinedType |
| Comments | Only complex types can be constrained, not primitive types such as string etc. |
| Invariants | **Affect this element** **Inv-12**: Only complex types can be constrained, not primitive types such as string etc. (xpath: upper-case(substring(f:type,1,1))=substring(f:type,1,1)) |
| **Profile.structure.name** | |
| Definition | The name of this resource constraint statement (to refer to it from other resource constraints - from Profile.structure.element.definition.type.profile) |
| Control | 0..1 |
| Type | string |
| Comments | This field is the target for a resource.profile |
| **Profile.structure.publish** | |
| Definition | This definition of a profile on a structure is published as a formal statement. Some structural definitions might be defined purely for internal use within the profile, and not intended to be used outside that context |
| Control | 0..1 |
| Type | boolean |
| Comments | If there is more than one published structure for each type, and the URL reference to the profile doesn't specify which named structure to use (using a URL fragment, e.g. #...) then which profile to use is indeterminate, and an error should be raised |
| **Profile.structure.purpose** | |
| Definition | Human summary: why describe this resource? |
| Control | 0..1 |
| Type | string |
| **Profile.structure.element** | |
| Definition | Captures constraints on each element within the resource |
| Control | 0..\* |
| Invariants | **Affect this element** **Inv-1**: Provide either a profile reference or constraints on the resource elements (but not both) (xpath: exists(f:profile) != exists(f:element)) |
| **Profile.structure.element.path** | |
| Definition | The path identifies the element and is expressed as a "."-separated list of ancestor elements, beginning with the name of the resource |
| Control | 1..1 |
| Type | string |
| **Profile.structure.element.name** | |
| Definition | The name of this element definition (to refer to it from other element definitions using Profile.structure.element.definition.nameReference). This is a unique name referring to a specific set of constraints applied to this element. One use of this is to provide a name to different slices of the same element |
| Control | 0..1 |
| Type | string |
| Comments | The name must be unique within the profile and all imported profiles within the context of the constrained resource element. (Though to avoid confusion, uniqueness across all elements is recommended.) |
| **Profile.structure.element.slicing** | |
| Definition | Indicates that the element is sliced into a set of alternative definitions (there are multiple definitions on a single element in the base resource). The set of slices is any elements that come after this in the element sequence that have the same path, until a shorter path occurs (the shorter path terminates the set) |
| Control | 0..1 |
| Comments | The definition associated with this element definition is the master for all the slices |
| **Profile.structure.element.slicing.discriminator** | |
| Definition | Designates which child element is used to discriminate between the slices when processing an instance. The value of the child element in the instance must completely distinguish which slice the element in the resource matches based on the allowed values for that element in each of the slices |
| Control | 1..1 |
| Type | id |
| **Profile.structure.element.slicing.ordered** | |
| Definition | If the matching elements have to occur in the same order as defined in the profile |
| Control | 1..1 |
| Type | boolean |
| Comments | Order should only be required when it is a pressing concern for presentation. Profile authors should consider making the order a feature of the rules about the narrative, not the rules about the data - requiring ordered data makes the profile much less re-usable |
| **Profile.structure.element.slicing.rules** | |
| Definition | Whether additional slices are allowed or not. When the slices are ordered, profile authors can also say that additional slices are only allowed at the end |
| Control | 1..1 |
| Binding | SlicingRules : How slices are interpreted when evaluating an instance (see [http://hl7.org/fhir/resource-slicing-rules](http://hl7.org/implement/standards/fhir/fhir-book.htm#resource-slicing-rules) for values) |
| Type | code from SlicingRules |
| Comments | Allowing additional elements makes for a much for flexible template - it's open for use in wider contexts, but also means that the content of the resource is not closed, and applications have to decide how to handle content not described by the profile |
| **Profile.structure.element.definition** | |
| Definition | Definition of the content of the element to provide a more specific definition than that contained for the element in the base resource |
| Control | 0..1 |
| Comments | The definition must be a proper constraint on the definition of the base resource |
| Invariants | **Defined on this element** **Inv-2**: Either a namereference or a fixed value (but not both) is permitted (xpath: not(exists(f:nameReference) and exists(f:\*[starts-with(local-name(.), 'value')]))) **Inv-7**: Binding can only be present for coded elements (xpath: not(exists(f:binding)) or f:type/f:code/@value=('code','Coding','CodeableConcept','Quantity')) **Inv-10**: Value may only be specified if the type consists of a single repetition that has a type corresponding to one of the primitive data types. (xpath: not(exists(f:\*[starts-with(local-name(.), 'value')])) or (count(f:type)=1 and f:type/f:code[substring(@value,1,1)=lower-case(substring(@value,1,1))])) |
| **Profile.structure.element.definition.short** | |
| Definition | A concise definition that is shown in the concise XML format that summarizes profiles |
| Control | 1..1 |
| Type | string |
| Comments | May change the term to provide language more appropriate to the context of the profile or to reflect slicing |
| **Profile.structure.element.definition.formal** | |
| Definition | The definition must be consistent with the base definition, but convey the meaning of the element in the particular context of use of the resource |
| Control | 1..1 |
| Type | string |
| Requirements | To allow a user to clarify the usage of an element in a particular context |
| Comments | It is easy for a different definition to change the meaning of an element and this can have nasty downstream consequences. Please be careful when providing definitions |
| **Profile.structure.element.definition.comments** | |
| Definition | Comments about the use of the element, including notes about how to use the data properly, exceptions to proper use, etc. |
| Control | 0..1 |
| Type | string |
| Comments | If it is possible to capture usage rules using invariants, that mechanism should be used in preference to this element |
| **Profile.structure.element.definition.requirements** | |
| Definition | Explains why this element is needed and why it's been constrained as it has |
| Control | 0..1 |
| Type | string |
| **Profile.structure.element.definition.synonym** | |
| Definition | Identifies additional names by which this element might also be known |
| Control | 0..\* |
| Type | string |
| Requirements | Allows for better easier recognition of the element by multiple communities, including international communities |
| **Profile.structure.element.definition.min** | |
| Definition | The minimum number of times this element must appear in the instance |
| Control | 1..1 |
| Type | integer |
| **Profile.structure.element.definition.max** | |
| Definition | The maximum number of times this element is permitted to appear in the instance |
| Control | 1..1 |
| Type | string |
| Invariants | **Defined on this element** **Inv-6**: Max must be a number or "\*" (xpath: @value='\*' or (normalize-space(@value)!='' and normalize-space(translate(@value, '0123456789',''))=''))**Affect this element** **Inv-6**: Max must be a number or "\*" (xpath: @value='\*' or (normalize-space(@value)!='' and normalize-space(translate(@value, '0123456789',''))='')) |
| **Profile.structure.element.definition.type** | |
| Definition | The data type or resource that the value of this element is permitted to be |
| Control | 0..\* |
| Requirements | The Type of the element can be left blank, in which case the type is inherited from the resource. The type can only be listed in this field if it is an allowed option in the base resource |
| Invariants | **Defined on this element** **Inv-9**: Bundled may only be specified if one of the allowed types for the element is a resource (xpath: not(exists(f:bundled)) or exists(f:code[starts-with(@value, 'Resource(')])) |
| **Profile.structure.element.definition.type.code** | |
| Definition | Data type or Resource |
| Control | 1..1 |
| Binding | DataType : [Any defined Data Type name (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#data-types) |
| Type | code from DataType |
| **Profile.structure.element.definition.type.profile** | |
| Definition | Identifies a profile that must hold for resources or datatypes referenced as the type of this element. Can be a local reference - to another structure in this profile, or a reference to a structure in another profile |
| Control | 0..1 |
| Type | uri |
| Comments | The reference might be a simple name in the form #[name], which is a reference to another named constraint in a resource - where the resource contains more than one constraint, or a URL which is a reference to a resource Profile |
| Invariants | **Affect this element** **Inv-8**: Must define at least one resource constraint, extension definition or binding (xpath: exists(f:structure) or exists(f:extensionDefn) or exists(f:binding)) |
| **Profile.structure.element.definition.type.bundled** | |
| Definition | Whether the Resource that is the value for this element is included in the bundle, if the profile is specifying a bundle |
| Control | 0..1 |
| Type | boolean |
| Comments | If context includes bundling |
| Invariants | **Affect this element** **Inv-9**: Bundled may only be specified if one of the allowed types for the element is a resource (xpath: not(exists(f:bundled)) or exists(f:code[starts-with(@value, 'Resource(')])) |
| **Profile.structure.element.definition.nameReference** | |
| Definition | Identifies the name of a slice defined elsewhere in the profile whose constraints should be applied to the current element |
| Control | 0..1 |
| Type | string |
| Comments | If child components of this element are defined, they act as constraints on the referenced slice |
| Invariants | **Affect this element** **Inv-2**: Either a namereference or a fixed value (but not both) is permitted (xpath: not(exists(f:nameReference) and exists(f:\*[starts-with(local-name(.), 'value')]))) |
| **Profile.structure.element.definition.value[x]** | |
| Definition | Specifies a value that must hold for this element in the instance |
| Control | 0..1 |
| Type | \* |
| Comments | To specify a fixed value for a complex data type, include the child elements for the type and specify fixed values for each property independently |
| Invariants | **Affect this element** **Inv-2**: Either a namereference or a fixed value (but not both) is permitted (xpath: not(exists(f:nameReference) and exists(f:\*[starts-with(local-name(.), 'value')]))) **Inv-10**: Value may only be specified if the type consists of a single repetition that has a type corresponding to one of the primitive data types. (xpath: not(exists(f:\*[starts-with(local-name(.), 'value')])) or (count(f:type)=1 and f:type/f:code[substring(@value,1,1)=lower-case(substring(@value,1,1))])) |
| **Profile.structure.element.definition.example[x]** | |
| Definition | An example value for this element |
| Control | 0..1 |
| Type | \* |
| Comments | If the example value are fully populated, the publication tool can generate an instance automatically |
| **Profile.structure.element.definition.maxLength** | |
| Definition | Indicates the shortest length that must be supported by conformant instances without truncation |
| Control | 0..1 |
| Type | integer |
| Comments | If not specified, there is no conformance expectation for length support |
| To Do | Need to flesh this out more - leverage v2 approach |
| **Profile.structure.element.definition.condition** | |
| Definition | A reference to an invariant that may make additional statements about the cardinality in the instance |
| Control | 0..\* |
| Type | id |
| **Profile.structure.element.definition.constraint** | |
| Definition | Formal constraints such as co-occurrence and other constraints that can be computationally evaluated within the context of the instance |
| Control | 0..\* |
| Comments | Constraints should be declared on the "context" element - the lowest element in the hierarchy that is common to all nodes referenced by the constraint |
| **Profile.structure.element.definition.constraint.key** | |
| Definition | Allows identification of which elements have their cardinalities impacted by the constraint. Will not be referenced for constraints that do not affect cardinality |
| Control | 1..1 |
| Type | id |
| **Profile.structure.element.definition.constraint.name** | |
| Definition | Used to label the constraint in OCL or in short displays incapable of displaying the full human description |
| Control | 0..1 |
| Type | string |
| **Profile.structure.element.definition.constraint.severity** | |
| Definition | Identifies the impact constraint violation has on the conformance of the instance |
| Control | 1..1 |
| Binding | ConstraintSeverity : Must applications comply with this constraint? (see [http://hl7.org/fhir/constraint-severity](http://hl7.org/implement/standards/fhir/fhir-book.htm#constraint-severity) for values) |
| Type | code from ConstraintSeverity |
| Comments | This allows constraints to be asserted as "shall" (error) and "should" (warning) |
| **Profile.structure.element.definition.constraint.human** | |
| Definition | This is the text that describes the constraint in messages identifying that the constraint has been violated |
| Control | 1..1 |
| Type | string |
| Comments | Should be expressed in business terms as much as possible |
| **Profile.structure.element.definition.constraint.xpath** | |
| Definition | XPath expression of constraint |
| Control | 1..1 |
| Type | string |
| Requirements | Used in Schematron tests of the validity of the resource |
| Comments | Elements must use "f" as the namespace prefix and must not use any other prefixes |
| **Profile.structure.element.definition.constraint.ocl** | |
| Definition | OCL expression of constraint |
| Control | 0..1 |
| Type | string |
| **Profile.structure.element.definition.mustSupport** | |
| Definition | If true, conformant resource authors must be capable of providing a value for the element and resource consumers must be capable of extracting and doing something useful with the data element. If false, the element may be ignored and not supported |
| Control | 0..1 |
| Type | boolean |
| Requirements | Allows a profile to set expectations for system capabilities beyond merely respecting cardinality constraints |
| Comments | "Something useful" is context dependent. Key test is what would a reasonable observer expect of a system that explicitly claims to "support" this element |
| **Profile.structure.element.definition.mustUnderstand** | |
| Definition | If true, the element cannot be ignored by systems unless they recognize the element and a pre-determination has been made that it is not relevant to their particular system |
| Control | 0..1 |
| Type | boolean |
| Requirements | Allows elements to be introduced into a specification that can't safely be ignored by applications that don't recognize them |
| Comments | MustUnderstand elements can be ignored by applications that recognize the element and know that the element is not relevant in the context of their system. |
| **Profile.structure.element.definition.binding** | |
| Definition | Identifies the set of codes that applies to this element if a data type supporting codes is used. The reference can be local - to a Profile.binding.name, or absolute, to a binding.name in another profile |
| Control | 0..1 |
| Type | uri |
| Invariants | **Affect this element** **Inv-7**: Binding can only be present for coded elements (xpath: not(exists(f:binding)) or f:type/f:code/@value=('code','Coding','CodeableConcept','Quantity')) |
| **Profile.structure.element.definition.mapping** | |
| Definition | Identifies a concept from an external specification that roughly corresponds to this element |
| Control | 0..\* |
| Requirements | Provides guidance to implementers familiar with or converting content from other specifications |
| Comments | Mappings are not necessarily specific enough for safe translation |
| **Profile.structure.element.definition.mapping.target** | |
| Definition | The name of the specification is mapping is being expressed to |
| Control | 1..1 |
| Type | string |
| Comments | HL7 will provide guidelines for the name strings to use for common specifications |
| **Profile.structure.element.definition.mapping.map** | |
| Definition | Expresses what part of the target specification corresponds to this element |
| Control | 0..1 |
| Type | string |
| Comments | For most mappings, the syntax is undefined. Syntax will be provided for mappings to the RIM. Multiple mappings may be possible and may include constraints on other resource elements that identify when a particular mapping applies |
| **Profile.structure.searchParam** | |
| Definition | Defines additional search parameters for implementations to support and/or make use of |
| Control | 0..\* |
| **Profile.structure.searchParam.name** | |
| Definition | Corresponds to the name of the standard or custom search parameter |
| Control | 1..1 |
| Type | string |
| Comments | Parameter names cannot overlap with standard parameter names, and standard parameters cannot be redefined |
| **Profile.structure.searchParam.type** | |
| Definition | The type of value a search parameter refers to, and how the content is interpreted |
| Control | 1..1 |
| Binding | SearchParamType : Data types allowed to be used for search parameters (see [http://hl7.org/fhir/search-param-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#search-param-type) for values) |
| Type | code from SearchParamType |
| **Profile.structure.searchParam.documentation** | |
| Definition | For standard parameters, provides additional information on how the parameter is used in this solution. For custom parameters, provides a description of what the parameter does |
| Control | 1..1 |
| Type | string |
| **Profile.extensionDefn** | |
| Definition | An extension defined as part of the profile |
| Control | 0..\* |
| Invariants | **Affect this element** **Inv-8**: Must define at least one resource constraint, extension definition or binding (xpath: exists(f:structure) or exists(f:extensionDefn) or exists(f:binding)) |
| **Profile.extensionDefn.code** | |
| Definition | A unique code (within the profile) used to identify the extension |
| Control | 1..1 |
| Type | code from ! |
| Comments | Matches the portion of a reference to an extension after the # in the a url to the profile |
| Invariants | **Defined on this element** **Inv-5**: Codes must be unique in the context of a profile (xpath: count(ancestor::f:Profile/f:extensionDefn/f:code[@value=current()/@value])=1)**Affect this element** **Inv-5**: Codes must be unique in the context of a profile (xpath: count(ancestor::f:Profile/f:extensionDefn/f:code[@value=current()/@value])=1) |
| **Profile.extensionDefn.contextType** | |
| Definition | Identifies the type of context to which the extension applies |
| Control | 1..1 |
| Binding | ExtensionContext : How an extension context is interpreted (see [http://hl7.org/fhir/extension-context](http://hl7.org/implement/standards/fhir/fhir-book.htm#extension-context) for values) |
| Type | code from ExtensionContext |
| **Profile.extensionDefn.context** | |
| Definition | Identifies the types of resource or data type elements to which the extension can be applied |
| Control | 1..\* |
| Type | string |
| **Profile.extensionDefn.definition** | |
| Definition | Definition of the extension and its content |
| Control | 1..1 |
| Type | @Profile.structure.element.definition |
| **Profile.binding** | |
| Definition | Defines a linkage between a vocabulary binding name used in the profile (or expected to be used in profile importing this one) and a value set or code list |
| Control | 0..\* |
| Invariants | **Defined on this element** **Inv-3**: provide either a reference or a description (xpath: (exists(f:referenceUri) or exists(f:referenceResource)) or exists(f:description) or exists(f:name)) **Inv-14**: Example value sets are always extensible (xpath: not(f:conformance/@value='example' and f:isExtensible.value='false'))**Affect this element** **Inv-12**: Only complex types can be constrained, not primitive types such as string etc. (xpath: upper-case(substring(f:type,1,1))=substring(f:type,1,1)) |
| **Profile.binding.name** | |
| Definition | The name to be associated with this set of codes |
| Control | 1..1 |
| Type | string |
| Comments | Must be unique within the profile. If the same name as an imported profile, will override the imported binding (and must be a proper constraint on the imported binding) |
| Invariants | **Defined on this element** **Inv-11**: Binding name must be unique in the context of a profile (xpath: count(ancestor::f:Profile/f:binding/f:name[@value=current()/@value])=1)**Affect this element** **Inv-11**: Binding name must be unique in the context of a profile (xpath: count(ancestor::f:Profile/f:binding/f:name[@value=current()/@value])=1) |
| **Profile.binding.isExtensible** | |
| Definition | If true, then conformant systems may use additional codes or (where the data type permits) text alone to convey concepts not covered by the set of codes identified in the binding. If false, then conformant systems are constrained to the provided codes alone |
| Control | 0..1 |
| Type | boolean |
| Comments | When the binding use used for elements with a type of "code" (rather than Coding or CodableConcept), the binding is treated as non-extensible regardless of the value of this property |
| Invariants | **Affect this element** **Inv-14**: Example value sets are always extensible (xpath: not(f:conformance/@value='example' and f:isExtensible.value='false')) |
| **Profile.binding.conformance** | |
| Definition | Indicates the degree of conformance expectations associated with this binding |
| Control | 0..1 |
| Binding | BindingConformance : Must applications comply with this binding? (see [http://hl7.org/fhir/binding-conformance](http://hl7.org/implement/standards/fhir/fhir-book.htm#binding-conformance) for values) |
| Type | code from BindingConformance |
| Invariants | **Affect this element** **Inv-14**: Example value sets are always extensible (xpath: not(f:conformance/@value='example' and f:isExtensible.value='false')) |
| **Profile.binding.description** | |
| Definition | Describes the intended use of this particular set of codes |
| Control | 0..1 |
| Type | string |
| Invariants | **Affect this element** **Inv-3**: provide either a reference or a description (xpath: (exists(f:referenceUri) or exists(f:referenceResource)) or exists(f:description) or exists(f:name)) |
| **Profile.binding.reference[x]** | |
| Definition | Points to the value set or external definition that identifies the set of codes to be used |
| Control | 0..1 |
| Type | uri|Resource(ValueSet) |
| Comments | For value sets, the referenceResource, the display can contain the value set description. The reference may be version-specific or not |
| Invariants | **Defined on this element** **Inv-13**: uri must start with http:// or https:// (xpath: starts-with(@value, 'http:') or starts-with(@value, 'https:'))**Affect this element** **Inv-3**: provide either a reference or a description (xpath: (exists(f:referenceUri) or exists(f:referenceResource)) or exists(f:description) or exists(f:name)) |

## 5.46: Resource Formal Definitions: Provenance

The formal definitions for the [Provenance (§3.39)](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance) resource.

|  |  |
| --- | --- |
| **Provenance** | |
| Definition | Provenance information associated with another resource that can be used to help determine its reliability or trace where the information in it came from. The focus of the provenance resource is record keeping, audit and traceability, not clinical meaning |
| Control | 1..1 |
| Comments | Some parties may be duplicated between the target resource and its provenance. For instance, the prescriber is usually (but not always) the author of the prescription resource. This resource is defined with close consideration for W3C Provenance |
| **Provenance.target** | |
| Definition | The resource(s) that this provenance information pertains to. A provenance can point to more than one target if multiple resources were created/updated by the same action |
| Control | 1..\* |
| Type | Resource(Any) |
| Comments | Target references are usually version specific, but may not be, if a version has not been assigned or if the provenance information is part of the set of resources being maintained (i.e. a document) |
| **Provenance.activity** | |
| Definition | The activity that was being undertaken that led to the creation of the resource being referenced |
| Control | 1..1 |
| **Provenance.activity.period** | |
| Definition | The period during which the activity occurred |
| Control | 0..1 |
| Type | Period |
| Comments | The period can be a little arbitrary; where possible, the time should correspond to human assessment of the activity time |
| **Provenance.activity.recorded** | |
| Definition | The instant of time at which the activity was recorded |
| Control | 1..1 |
| Type | instant |
| Comments | This can be a little different from the time stamp on the resource if there is a delay between recording the event and updating the provenance and target resource |
| **Provenance.activity.reason** | |
| Definition | The reason that the activity was taking place |
| Control | 0..1 |
| Type | CodeableConcept |
| **Provenance.activity.location** | |
| Definition | Where the activity occurred, if relevant |
| Control | 0..1 |
| Type | Resource(Location) |
| **Provenance.activity.policy** | |
| Definition | Policy or plan the activity was defined by |
| Control | 0..1 |
| Type | uri |
| **Provenance.party** | |
| Definition | An entity that is involved in the provenance of the target resource |
| Control | 0..\* |
| To Do | Is DRIV the appropriate semantic for "support"? |
| **Provenance.party.role** | |
| Definition | The role that the participant played |
| Control | 1..1 |
| Binding | ProvenanceParticipantRole : The role that a provenance participant played (see [http://hl7.org/fhir/provenance-participant-role](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-role) for values) |
| Type | Coding from ProvenanceParticipantRole |
| To Do | Figure out how to handle: application, daemon for RIM mappings. Figure out better mapping for attestor, perhaps after RIM harmonization proposal |
| **Provenance.party.type** | |
| Definition | The type of the participant |
| Control | 1..1 |
| Binding | ProvenanceParticipantType : The type of a provenance participant (see [http://hl7.org/fhir/provenance-participant-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#provenance-participant-type) for values) |
| Type | Coding from ProvenanceParticipantType |
| Comments | If the type is "resource" then the resource itself was the participant. If the type is a type of resource, then the entity identified by the resource is the participant |
| To Do | Not sure how to make "resource" or "record" RIM mappings work |
| **Provenance.party.identifier** | |
| Definition | Identity of participant. May be a logical or physical uri and maybe absolute or relative |
| Control | 1..1 |
| Type | uri |
| Comments | identity may be a reference to a resource or to something else, depending on the type |
| **Provenance.party.description** | |
| Definition | Human readable description of the participant |
| Control | 0..1 |
| Type | string |
| **Provenance.signature** | |
| Definition | A digital signature on the target resource. The signature should reference a participant by xml:id. The signature is only added to support checking cryptographic integrity of the provenance, and not to represent workflow and clinical aspects of the signing process |
| Control | 0..1 |
| Type | string |
| Comments | Whether the content is xml or json, the representation is as a base64 of the XML signature of the resource |

## 5.47: Resource Formal Definitions: Query

The formal definitions for the [Query (§2.2)](http://hl7.org/implement/standards/fhir/fhir-book.htm#query) resource.

|  |  |
| --- | --- |
| **Query** | |
| Definition | A description of a query with a set of parameters |
| Control | 1..1 |
| **Query.identifier** | |
| Definition | Links query and its response(s) |
| Control | 1..1 |
| Type | uri |
| **Query.parameter** | |
| Definition | Set of query parameters with values |
| Control | 1..\* |
| Type | Extension |
| Comments | Unless otherwise specified, parameters are usually strings |
| **Query.response** | |
| Definition | If this is a response to a query |
| Control | 0..1 |
| **Query.response.identifier** | |
| Definition | Links response to source query |
| Control | 1..1 |
| Type | uri |
| **Query.response.outcome** | |
| Definition | Outcome of processing the query |
| Control | 1..1 |
| Binding | QueryOutcome : The outcome of processing a query request (see [http://hl7.org/fhir/query-outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#query-outcome) for values) |
| Type | code from QueryOutcome |
| **Query.response.total** | |
| Definition | Total number of matching records |
| Control | 0..1 |
| Type | integer |
| **Query.response.parameter** | |
| Definition | Parameters server used |
| Control | 0..\* |
| Type | Extension |
| **Query.response.first** | |
| Definition | To get first page (if paged) |
| Control | 0..\* |
| Type | Extension |
| **Query.response.previous** | |
| Definition | To get previous page (if paged) |
| Control | 0..\* |
| Type | Extension |
| **Query.response.next** | |
| Definition | To get next page (if paged) |
| Control | 0..\* |
| Type | Extension |
| **Query.response.last** | |
| Definition | To get last page (if paged) |
| Control | 0..\* |
| Type | Extension |
| **Query.response.reference** | |
| Definition | Resources that are the results of the search |
| Control | 0..\* |
| Type | Resource(Any) |
| Comments | Is query only used in messaging? |

## 5.48: Resource Formal Definitions: Questionnaire

The formal definitions for the [Questionnaire (§3.40)](http://hl7.org/implement/standards/fhir/fhir-book.htm#questionnaire) resource.

|  |  |
| --- | --- |
| **Questionnaire** | |
| Definition | A set of answers to predefined lists of questions. The questions may be ordered and grouped into coherent subsets, corresponding to the structure of the grouping of the underlying questions. |
| Control | 1..1 |
| Requirements | To support structured, hierarchical registration of data gathered using digital forms and other questionnaires. |
| Aliases | Form |
| **Questionnaire.status** | |
| Definition | The status of the questionnaire as a whole |
| Control | 1..1 |
| Binding | ObservationStatus : Codes providing the status of an observation (see [http://hl7.org/fhir/observation-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#observation-status) for values) |
| Type | code from ObservationStatus |
| Must Understand | true |
| Requirements | The information on questionnaires may possibly gathered during multiple sessions and altered after considered being finished. |
| Summary | true |
| **Questionnaire.authored** | |
| Definition | The date and/or time that this version of the questionnaire was authored |
| Control | 1..1 |
| Type | dateTime |
| Requirements | Clinicians need to be able to check the date that the information in the questionnaire was collected, to derive the context of the answers. |
| Aliases | Date Created; Date published; Date Issued; Date updated |
| Summary | true |
| Comments | May be different from the update time of the resource itself, because that is the status of the collection and authoring. |
| **Questionnaire.subject** | |
| Definition | The subject of the questionnaires: this is the patient that the answers apply to, but this person is not necessarily the source of information |
| Control | 0..1 |
| Type | Resource(Patient|RelatedPerson) |
| Requirements | Must know the subject context |
| Aliases | Patient |
| Summary | true |
| **Questionnaire.author** | |
| Definition | Person that collected the answers to the questions in the Questionnaire |
| Control | 0..1 |
| Type | Resource(Practitioner|Patient|RelatedPerson) |
| Requirements | Need to know who interpreted the subject's answers to the questions in the questionnaire, and selected the appropriate options for answers. |
| Aliases | Laboratory; Service; Practitioner; Department; Company |
| Summary | true |
| Comments | Mapping a subject's answers to multiple choice options and determining what to put in textual answer is a matter of interpretation. |
| **Questionnaire.source** | |
| Definition | The person that answered the questions about the subject. Only used when this is not the subject him/herself |
| Control | 0..1 |
| Type | Resource(Patient|Practitioner|RelatedPerson) |
| Requirements | When answering questions about a subject that is minor, incapable of answering or an animal, another human source is used to answer the questions |
| Summary | true |
| To Do | source should be a reference to a Person resource too |
| **Questionnaire.name** | |
| Definition | Structured name for a predefined list of questions this questionnaire is responding to |
| Control | 0..1 |
| Binding | QuestionnaireName : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-name)) |
| Type | CodeableConcept from QuestionnaireName |
| Requirements | Need to supply the type of form that was used to collect the answers in this questionnaire |
| Summary | true |
| **Questionnaire.identifier** | |
| Definition | An identifier that identifier this specific set of answers |
| Control | 0..1 |
| Type | Identifier |
| Summary | true |
| **Questionnaire.encounter** | |
| Definition | Encounter during which this questionnaire answers were collected. When there were multiple encounters, this is the one considered most relevant to the context of the answers. |
| Control | 0..1 |
| Type | Resource(Encounter) |
| Requirements | Some institutions track questionnaires under a specific encounter |
| Summary | true |
| **Questionnaire.question** | |
| Definition | Answers to questions on a questionnaire |
| Control | 0..\* |
| Requirements | Must register answers to questions |
| Aliases | Responses; Contents |
| Invariants | **Defined on this element** **Inv-1**: Must supply either a simple answer, a choice, data or nothing (xpath: count(f:data) + count(f:choice) + count(f:value) <= 1) |
| **Questionnaire.question.name** | |
| Definition | Structured name for the question |
| Control | 0..1 |
| Binding | QuestionName : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-question-name)) |
| Type | CodeableConcept from QuestionName |
| Requirements | Structured name identified the question so the answers can be identified, extracted and used. |
| **Questionnaire.question.text** | |
| Definition | Text of the question as it may appear on screen or on a form |
| Control | 0..1 |
| Type | string |
| Requirements | When including text for the questionnaire, each question may contain its actual question display text |
| **Questionnaire.question.answer[x]** | |
| Definition | Single-valued answer to the question |
| Control | 0..1 |
| Type | decimal|integer|boolean|date|string|dateTime|instant |
| Requirements | Need to be able to retain a single-valued answers to a question |
| Invariants | **Affect this element** **Inv-1**: Must supply either a simple answer, a choice, data or nothing (xpath: count(f:data) + count(f:choice) + count(f:value) <= 1) |
| **Questionnaire.question.choice** | |
| Definition | One of more selections from the list of options |
| Control | 0..\* |
| Type | Coding |
| **Questionnaire.question.options[x]** | |
| Definition | Reference to a valueset containing the possible options |
| Control | 0..1 |
| Type | uri|Resource(ValueSet) |
| **Questionnaire.question.data[x]** | |
| Definition | Structured answer in the form of a FHIR Resource or datatype |
| Control | 0..1 |
| Type | \* |
| Requirements | Depending on the system used to compose a Questionnaire instance, it may be possible for such a system to supply answers in the form of structured FHIR data. |
| Invariants | **Affect this element** **Inv-1**: Must supply either a simple answer, a choice, data or nothing (xpath: count(f:data) + count(f:choice) + count(f:value) <= 1) |
| **Questionnaire.question.remarks** | |
| Definition | The remark contains information about the answer given. This is additional information about the answer the author wishes to convey, but should not be used to contain information that is part of the answer itself. |
| Control | 0..1 |
| Type | string |
| Requirements | Many questionnaires allow you to include "comments" in addition to the answers given. |
| **Questionnaire.group** | |
| Definition | A group of questions to a possibly similarly grouped set of question in the questionnaire |
| Control | 0..\* |
| Requirements | Need to be able to logically group answers to grouped questions |
| **Questionnaire.group.name** | |
| Definition | Structured name for a section of a predefined list of questions this questionnaire is responding to. |
| Control | 0..1 |
| Binding | QuestionnaireGroupName : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-questionnaire-group-name)) |
| Type | CodeableConcept from QuestionnaireGroupName |
| Requirements | Structured names identify the group so the answers can be identified, extracted and used. |
| **Questionnaire.group.header** | |
| Definition | Header for the group, used for display purposes |
| Control | 0..1 |
| Type | string |
| Requirements | When including text for the questionnaire with the answers, sections may have a section header |
| **Questionnaire.group.text** | |
| Definition | Additional text for the group, used for display purposes |
| Control | 0..1 |
| Type | string |
| Requirements | When including text for the questionnaire, each section may contain additional explanations are background text |
| **Questionnaire.group.subject** | |
| Definition | More specific subject this section's answers are about, details the subject given in Questionnaire |
| Control | 0..1 |
| Type | Resource(Any) |
| Requirements | Sometimes a group of answers is about a specific participant, artifact or piece of information in the patient's care or record, e.g. a specific Problem, RelatedPerson, Allergy etc. |
| **Questionnaire.group.question** | |
| Definition | Set of questions within this group |
| Control | 0..\* |
| Type | @Questionnaire.question |
| Requirements | Need to be able to report information about the collected specimens on which the report is based |
| **Questionnaire.group.group** | |
| Definition | A sub-group within a group |
| Control | 0..\* |
| Type | @Questionnaire.group |
| Requirements | Reports can consist of complex nested groups |

## 5.49: Resource Formal Definitions: RelatedPerson

The formal definitions for the [RelatedPerson (§3.41)](http://hl7.org/implement/standards/fhir/fhir-book.htm#relatedperson) resource.

|  |  |
| --- | --- |
| **RelatedPerson** | |
| Definition | Information about a person that is involved in the care for a patient, but who is not the target of healthcare, nor has a formal responsibility in the care process |
| Control | 1..1 |
| Requirements | Need to track persons related to the patient or the healthcare process. |
| **RelatedPerson.identifier** | |
| Definition | Identifier for a person within a particular scope. |
| Control | 0..\* |
| Type | Identifier |
| Requirements | People are known by a variety of ids. Some institutions maintain several, and most collect identifiers for exchange with other organizations concerning the patient. Examples are national person identifier and local identifier |
| Summary | true |
| **RelatedPerson.patient** | |
| Definition | The patient this person is related to |
| Control | 1..1 |
| Type | Resource(Patient) |
| Requirements | We need to know which Patient this RelatedPerson is related to. |
| Summary | true |
| **RelatedPerson.relationship** | |
| Definition | The nature of the relationship between a patient and the related person |
| Control | 0..1 |
| Binding | PatientRelationshipType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-relatedperson-relationshiptype)) |
| Type | CodeableConcept from PatientRelationshipType |
| Requirements | We need to know the relationship with the patient since it influences the interpretation of the information attributed to this person. |
| Summary | true |
| **RelatedPerson.name** | |
| Definition | A name associated with the person |
| Control | 0..1 |
| Type | HumanName |
| Requirements | Related persons need to be identified by name, but it is uncommon to need details about multiple other names for that person |
| Summary | true |
| **RelatedPerson.telecom** | |
| Definition | A contact detail for the person, e.g. a telephone number or an email address. |
| Control | 0..\* |
| Type | Contact |
| Requirements | People have (primary) ways to contact them in some way such as phone, email. |
| Summary | true |
| Comments | Person may have multiple ways to be contacted with different uses or applicable periods. May need to have options for contacting the person urgently, and also to help with identification |
| **RelatedPerson.gender** | |
| Definition | Administrative Gender - the gender that the person is considered to have for administration and record keeping purposes. |
| Control | 0..1 |
| Binding | AdministrativeGender : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-administrative-gender)) |
| Type | CodeableConcept from AdministrativeGender |
| Requirements | Needed for identification of the person, in combination with (at least) name and birth date. |
| Summary | true |
| **RelatedPerson.address** | |
| Definition | Address where the related person can be contacted or visited |
| Control | 0..1 |
| Type | Address |
| Requirements | Need to keep track where the related person can be contacted per postal mail or visited |
| Summary | true |
| **RelatedPerson.photo** | |
| Definition | Image of the person |
| Control | 0..\* |
| Type | Attachment |
| Requirements | Many EHR systems have the capability to capture an image of persons. Fits with newer social media usage too. |

## 5.50: Resource Formal Definitions: SecurityEvent

The formal definitions for the [SecurityEvent (§3.42)](http://hl7.org/implement/standards/fhir/fhir-book.htm#securityevent) resource.

|  |  |
| --- | --- |
| **SecurityEvent** | |
| Definition | A record of an event made for purposes of maintaining a security log. Typical uses include detection of intrusion attempts and monitoring for inappropriate usage |
| Control | 1..1 |
| Comments | Based on ATNA (RFC 3881) |
| **SecurityEvent.event** | |
| Definition | Identifies the name, action type, time, and disposition of the audited event |
| Control | 1..1 |
| Requirements | The event must be identified |
| **SecurityEvent.event.type** | |
| Definition | Identifier for a family of the event |
| Control | 1..1 |
| Binding | SecurityEventType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-type)) |
| Type | CodeableConcept from SecurityEventType |
| Requirements | This identifies the audited function. For "Execute" Event Action Code audit records, this identifies the application function performed. |
| Comments | e.g., a menu item, program, rule, policy, function code, application name or URL. It identifies the performed function |
| **SecurityEvent.event.subtype** | |
| Definition | Identifier for the category of event |
| Control | 0..\* |
| Binding | SecurityEventSubType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sub-type)) |
| Type | CodeableConcept from SecurityEventSubType |
| Requirements | This field enables queries of messages by implementation-defined event categories |
| **SecurityEvent.event.action** | |
| Definition | Indicator for type of action performed during the event that generated the audit |
| Control | 0..1 |
| Binding | SecurityEventAction : Indicator for type of action performed during the event that generated the audit. (see [http://hl7.org/fhir/security-event-action](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-action) for values) |
| Type | code from SecurityEventAction |
| Requirements | This broadly indicates what kind of action was done on the Participant Object |
| **SecurityEvent.event.dateTime** | |
| Definition | The time when the event occurred on the source |
| Control | 1..1 |
| Type | instant |
| Requirements | This ties an event to a specific date and time. Security audits typically require a consistent time base, e.g., UTC, to eliminate time-zone issues arising from geographical distribution |
| Comments | In a distributed system, some sort of common time base, e.g., an NTP [RFC1305] server, is a good implementation tactic |
| **SecurityEvent.event.outcome** | |
| Definition | Indicates whether the event succeeded or failed |
| Control | 0..1 |
| Binding | SecurityEventOutcome : Indicates whether the event succeeded or failed (see [http://hl7.org/fhir/security-event-outcome](http://hl7.org/implement/standards/fhir/fhir-book.htm#security-event-outcome) for values) |
| Type | code from SecurityEventOutcome |
| Comments | In some cases a "success" may be partial, for example, an incomplete or interrupted transfer of a radiological study. For the purpose of establishing accountability, these distinctions are not relevant |
| **SecurityEvent.event.outcomeDesc** | |
| Definition | A free text description of the outcome of the event |
| Control | 0..1 |
| Type | string |
| **SecurityEvent.participant** | |
| Definition | A person, a hardware device or software process |
| Control | 1..\* |
| Requirements | The event has one or more active participants |
| Comments | There may be more than one user per event, for example, in cases of actions initiated by one user for other users, or in events that involve more than one user, hardware device, or system process. However, only one user may be the initiator/requestor for the event |
| Invariants | **Defined on this element** **Inv-3**: Either an userId or a reference (xpath: exists(f:userId) != exists(f:reference)) |
| **SecurityEvent.participant.role** | |
| Definition | Specification of the role(s) the user plays when performing the event. Usually the codes used in this element are local codes defined by the role-based access control security system used in the local context |
| Control | 0..\* |
| Binding | DicomRoleId : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-dicm-402-roleid)) |
| Type | CodeableConcept from DicomRoleId |
| Requirements | This value ties an audited event to a user's role(s). It is an optional value that might be used to group events for analysis by user functional role categories |
| **SecurityEvent.participant.reference** | |
| Definition | Direct reference to a resource that identifies the participant |
| Control | 0..1 |
| Type | Resource(Practitioner|Patient|Device) |
| Requirements | This field ties an audit event to a specific resource |
| Invariants | **Affect this element** **Inv-3**: Either an userId or a reference (xpath: exists(f:userId) != exists(f:reference)) |
| **SecurityEvent.participant.userId** | |
| Definition | Unique identifier for the user actively participating in the event |
| Control | 0..1 |
| Type | string |
| Requirements | This field ties an audit event to a specific user |
| Comments | a unique value within the Audit Source ID. For node-based authentication -- where only the system hardware or process, but not a human user, is identified -- User ID would be the node name |
| Invariants | **Affect this element** **Inv-3**: Either an userId or a reference (xpath: exists(f:userId) != exists(f:reference)) |
| **SecurityEvent.participant.authId** | |
| Definition | User identifier text string from authentication system. This identifier would be one known to a common authentication system (e.g., single sign-on), if available |
| Control | 0..1 |
| Type | string |
| Requirements | In some situations a user may authenticate with one identity but, to access a specific application system, may use a synonymous identify. For example, some "single sign on" implementations will do this. The alternative identifier would then be the original identify used for authentication, and the User ID is the one known to and used by the application |
| **SecurityEvent.participant.name** | |
| Definition | Human-meaningful name for the user |
| Control | 0..1 |
| Type | string |
| Requirements | The User ID and Authorization User ID may be internal or otherwise obscure values. This field assists the auditor in identifying the actual user |
| **SecurityEvent.participant.requestor** | |
| Definition | Indicator that the user is or is not the requestor, or initiator, for the event being audited. |
| Control | 1..1 |
| Type | boolean |
| Requirements | This value is used to distinguish between requestor-users and recipient-users. For example, one person may initiate a report-output to be sent to a another user |
| Comments | There can only be one initiator. If the initiator is not clear, then do not choose any one participant as the initiator |
| **SecurityEvent.participant.media** | |
| Definition | Type of media involved. Used when the event is about exporting/importing onto media |
| Control | 0..1 |
| Type | Coding |
| Requirements | Usually, this is used instead of specifying a network address. This field is not used for Media Id (i.e. the serial number of a CD) |
| To Do | Do we need an element for Media Id (as opposed to type) |
| **SecurityEvent.participant.network** | |
| Definition | Logical network location for application activity, if the activity has a network location |
| Control | 0..1 |
| **SecurityEvent.participant.network.identifier** | |
| Definition | An identifier for the network access point of the user device for the audit event |
| Control | 0..1 |
| Type | string |
| Requirements | This datum identifies the user's network access point, which may be distinct from the server that performed the action. It is an optional value that may be used to group events recorded on separate servers for analysis of a specific network access point's data access across all servers |
| Comments | This could be a device id, IP address or some other identifier associated with a device |
| **SecurityEvent.participant.network.type** | |
| Definition | An identifier for the type of network access point that originated the audit event |
| Control | 0..1 |
| Binding | SecurityEventParticipantNetworkType : the type of network access point that originated the audit event (see [http://hl7.org/fhir/network-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#network-type) for values) |
| Type | code from SecurityEventParticipantNetworkType |
| Requirements | This datum identifies the type of network access point identifier of the user device for the audit event. It is an optional value that may be used to group events recorded on separate servers for analysis of access according to a network access point's type |
| **SecurityEvent.source** | |
| Definition | Application systems and processes |
| Control | 1..1 |
| Requirements | The event is reported by one source |
| Comments | Since multi-tier, distributed, or composite applications make source identification ambiguous, this collection of fields may repeat for each application or process actively involved in the event. For example, multiple value-sets can identify participating web servers, application processes, and database server threads in an n-tier distributed application. Passive event participants, e.g., low-level network transports, need not be identified |
| **SecurityEvent.source.site** | |
| Definition | Logical source location within the healthcare enterprise network |
| Control | 0..1 |
| Type | string |
| Requirements | This value differentiates among the sites in a multi-site enterprise health information system |
| Comments | a hospital or other provider location within a multi-entity provider group |
| **SecurityEvent.source.identifier** | |
| Definition | Identifier of the source where the event originated |
| Control | 1..1 |
| Type | string |
| Requirements | This field ties the event to a specific source system. It may be used to group events for analysis according to where the event occurred |
| **SecurityEvent.source.type** | |
| Definition | Code specifying the type of source where event originated |
| Control | 0..\* |
| Binding | SecurityEventSourceType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-source-type)) |
| Type | Coding from SecurityEventSourceType |
| Requirements | This field indicates which type of source is identified by the Audit Source ID. It is an optional value that may be used to group events for analysis according to the type of source where the event occurred |
| **SecurityEvent.object** | |
| Definition | Specific instances of data or objects that have been accessed |
| Control | 0..\* |
| Requirements | The event may have other objects involved |
| Comments | required unless the values for Event Identification, Active Participant Identification, and Audit Source Identification are sufficient to document the entire auditable event. Because events may have more than one participant object, this group can be a repeating set of values. |
| Invariants | **Defined on this element** **Inv-1**: Either a name or a query (xpath: not(exists(f:name)) or not(exists(f:query))) **Inv-2**: Either an identifier or a reference (xpath: exists(f:identifier) != exists(f:reference)) |
| **SecurityEvent.object.identifier** | |
| Definition | Identifies a specific instance of the participant object. The reference should always be version specific |
| Control | 0..1 |
| Type | Identifier |
| Comments | Identifier details depends on object type |
| Invariants | **Affect this element** **Inv-2**: Either an identifier or a reference (xpath: exists(f:identifier) != exists(f:reference)) |
| **SecurityEvent.object.reference** | |
| Definition | Identifies a specific instance of the participant object. The reference should always be version specific |
| Control | 0..1 |
| Type | Resource(Any) |
| Invariants | **Affect this element** **Inv-2**: Either an identifier or a reference (xpath: exists(f:identifier) != exists(f:reference)) |
| **SecurityEvent.object.type** | |
| Definition | Object type being audited |
| Control | 0..1 |
| Binding | SecurityEventObjectType : Code for the participant object type being audited (see [http://hl7.org/fhir/object-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-type) for values) |
| Type | code from SecurityEventObjectType |
| Requirements | To describe the object being acted upon. In addition to queries on the subject of the action in an auditable event, it is also important to be able to query on the object type for the action |
| Comments | This value is distinct from the user's role or any user relationship to the participant object |
| **SecurityEvent.object.role** | |
| Definition | Code representing the functional application role of Participant Object being audited |
| Control | 0..1 |
| Binding | SecurityEventObjectRole : Code representing the functional application role of Participant Object being audited (see [http://hl7.org/fhir/object-role](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-role) for values) |
| Type | code from SecurityEventObjectRole |
| Requirements | For some detailed audit analysis it may be necessary to indicate a more granular type of participant, based on the application role it serves |
| Comments | See Rfc 3881 for rules concerning matches between role and type |
| **SecurityEvent.object.lifecycle** | |
| Definition | Identifier for the data life-cycle stage for the participant object |
| Control | 0..1 |
| Binding | SecurityEventObjectLifecycle : Identifier for the data life-cycle stage for the participant object (see [http://hl7.org/fhir/object-lifecycle](http://hl7.org/implement/standards/fhir/fhir-book.htm#object-lifecycle) for values) |
| Type | code from SecurityEventObjectLifecycle |
| Requirements | Institutional policies for privacy and security may optionally fall under different accountability rules based on data life cycle. This provides a differentiating value for those cases |
| Comments | This can be used to provide an audit trail for data, over time, as it passes through the system |
| **SecurityEvent.object.sensitivity** | |
| Definition | Denotes policy-defined sensitivity for the Participant Object ID such as VIP, HIV status, mental health status or similar topics |
| Control | 0..1 |
| Binding | SecurityEventObjectSensitivity : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-security-event-sensitivity)) |
| Type | CodeableConcept from SecurityEventObjectSensitivity |
| Requirements | This field identifies a specific instance of an object, such as a patient, to detect/track privacy and security issues |
| Comments | Values from ATNA are institution- and implementation-defined text strings (in sensitivity.text). HL7 defines confidentiality codes for records, documents etc. that can also be used here |
| **SecurityEvent.object.name** | |
| Definition | An instance-specific descriptor of the Participant Object ID audited, such as a person's name |
| Control | 0..1 |
| Type | string |
| Comments | This field may be used in a query/report to identify audit events for a specific person, e.g., where multiple synonymous Participant Object IDs (patient number, medical record number, encounter number, etc.) have been used |
| Invariants | **Affect this element** **Inv-1**: Either a name or a query (xpath: not(exists(f:name)) or not(exists(f:query))) |
| **SecurityEvent.object.query** | |
| Definition | The actual query for a query-type participant object |
| Control | 0..1 |
| Type | base64Binary |
| Requirements | For query events it may be necessary to capture the actual query input to the query process in order to identify the specific event. Because of differences among query implementations and data encoding for them, this is a base 64 encoded data blob. It may be subsequently decoded or interpreted by downstream audit analysis processing |
| Invariants | **Affect this element** **Inv-1**: Either a name or a query (xpath: not(exists(f:name)) or not(exists(f:query))) |
| **SecurityEvent.object.details** | |
| Definition | Additional Information about the Object |
| Control | 0..\* |
| **SecurityEvent.object.details.type** | |
| Definition | Name of the property |
| Control | 1..1 |
| Type | string |
| **SecurityEvent.object.details.value** | |
| Definition | Property value |
| Control | 1..1 |
| Type | base64Binary |

## 5.51: Resource Formal Definitions: Specimen

The formal definitions for the [Specimen (§3.43)](http://hl7.org/implement/standards/fhir/fhir-book.htm#specimen) resource.

|  |  |
| --- | --- |
| **Specimen** | |
| Definition | Sample for analysis |
| Control | 1..1 |
| **Specimen.identifier** | |
| Definition | Id for specimen |
| Control | 0..1 |
| Type | Identifier |
| **Specimen.type** | |
| Definition | The type of the specimen. This is sometimes called the "matrix" |
| Control | 0..1 |
| Binding | SpecimenType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-type)) |
| Type | CodeableConcept from SpecimenType |
| Comments | The type can change the way that a specimen is handled, and drives what kind of analyses can properly be performed on the specimen. It is frequently used in diagnostic work flow decision making systems |
| **Specimen.source** | |
| Definition | Parent specimen from which the focal specimen was a component |
| Control | 0..\* |
| **Specimen.source.relationship** | |
| Definition | Whether this relationship is to a parent or to a child |
| Control | 1..1 |
| Binding | HierarchicalRelationshipType : Type indicating if this is a parent or child relationship (see [http://hl7.org/fhir/hierarchical-relationship-type](http://hl7.org/implement/standards/fhir/fhir-book.htm#hierarchical-relationship-type) for values) |
| Type | code from HierarchicalRelationshipType |
| **Specimen.source.target** | |
| Definition | The specimen resource that is the target of this relationship |
| Control | 0..\* |
| Type | Resource(Specimen) |
| **Specimen.subject** | |
| Definition | The subject of the report |
| Control | 1..1 |
| Type | Resource(Patient|Group|Device|Substance) |
| Requirements | Must know the subject context |
| **Specimen.accessionIdentifier** | |
| Definition | The identifier(s) assigned by the lab when accessioning specimen(s). This is not necessarily the same as the specimen identifier, depending on local lab procedures. |
| Control | 0..\* |
| Type | Identifier |
| **Specimen.receivedTime** | |
| Definition | Time when specimen was received for processing or testing |
| Control | 0..1 |
| Type | dateTime |
| **Specimen.collection** | |
| Definition | Details concerning the specimen collection |
| Control | 1..1 |
| **Specimen.collection.collector** | |
| Definition | Person who collected the specimen |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| **Specimen.collection.comments** | |
| Definition | To communicate any details or issues encountered during the specimen collection procedure. |
| Control | 0..\* |
| Type | string |
| **Specimen.collection.collectedTime** | |
| Definition | Time when specimen was collected from subject - the physiologically relevant time |
| Control | 1..1 |
| Type | dateTime |
| **Specimen.collection.quantity** | |
| Definition | The quantity of specimen collected; for instance the volume of a blood sample, or the physical measurement of an anatomic pathology sample |
| Control | 0..1 |
| Type | Quantity |
| **Specimen.collection.method** | |
| Definition | A coded value specifying the technique that is used to perform the procedure |
| Control | 0..1 |
| Binding | SpecimenCollectionMethod : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-collection-type)) |
| Type | CodeableConcept from SpecimenCollectionMethod |
| **Specimen.collection.sourceSite** | |
| Definition | Anatomical location from which the specimen should be collected |
| Control | 0..1 |
| Binding | BodySite : SNOMED-CT Body site concepts ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-body-site)) |
| Type | CodeableConcept from BodySite |
| Aliases | location |
| **Specimen.treatment** | |
| Definition | Details concerning treatment and processing steps for the specimen |
| Control | 0..\* |
| **Specimen.treatment.description** | |
| Definition | Textual description of procedure |
| Control | 0..1 |
| Type | string |
| **Specimen.treatment.procedure** | |
| Definition | A coded value specifying the procedure used to process the specimen |
| Control | 0..1 |
| Binding | SpecimenTreatmentProcedure : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-treatment-procedure)) |
| Type | CodeableConcept from SpecimenTreatmentProcedure |
| **Specimen.treatment.additive** | |
| Definition | Specimen additive |
| Control | 0..\* |
| Type | Resource(Substance) |
| **Specimen.container** | |
| Definition | The container holding the specimen. May be recursive; ie blood in tube in tray in rack |
| Control | 0..\* |
| **Specimen.container.identifier** | |
| Definition | Id for container. There may be multiple; a manufacturer's bar code, lab assigned identifier, etc. |
| Control | 1..\* |
| Type | Identifier |
| **Specimen.container.description** | |
| Definition | Textual description of container |
| Control | 0..1 |
| Type | string |
| **Specimen.container.type** | |
| Definition | The type of container associated with the specimen (e.g. slide, aliquot, etc.) |
| Control | 0..1 |
| Binding | SpecimenContainerType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-specimen-container-type)) |
| Type | CodeableConcept from SpecimenContainerType |
| **Specimen.container.capacity** | |
| Definition | The capacity (volume or other measure the container may contain. |
| Control | 0..1 |
| Type | Quantity |
| **Specimen.container.specimenQuantity** | |
| Definition | The quantity of specimen in the container; may be volume, dimensions, or other appropriate measurements, depending on the specimen type |
| Control | 0..1 |
| Type | Quantity |
| **Specimen.container.additive** | |
| Definition | Additive associated with the container |
| Control | 0..1 |
| Type | Resource(Substance) |

## 5.52: Resource Formal Definitions: Substance

The formal definitions for the [Substance (§3.44)](http://hl7.org/implement/standards/fhir/fhir-book.htm#substance) resource.

|  |  |
| --- | --- |
| **Substance** | |
| Definition | Substance |
| Control | 1..1 |
| **Substance.identifier** | |
| Definition | Identifier of the substance |
| Control | 0..1 |
| Type | Identifier |
| **Substance.name** | |
| Definition | Name of the substance |
| Control | 1..1 |
| Type | string |
| **Substance.type** | |
| Definition | Type of the substance |
| Control | 0..1 |
| Binding | SubstanceType : valueset-substance-type |
| Type | CodeableConcept from SubstanceType |
| **Substance.description** | |
| Definition | Description of the substance |
| Control | 0..1 |
| Type | string |
| **Substance.status** | |
| Definition | Substance status |
| Control | 0..1 |
| Binding | SubstanceStatus : valueset-substance-status |
| Type | CodeableConcept from SubstanceStatus |
| **Substance.effectiveTime** | |
| Definition | When the substance is active or effective |
| Control | 0..1 |
| Type | Period |
| **Substance.quantity** | |
| Definition | The amount of the substance |
| Control | 0..1 |
| Type | Quantity |
| **Substance.ingredient** | |
| Definition | A substance can be composed of other substances |
| Control | 0..\* |
| Type | Resource(Substance) |
| **Substance.quantityMode** | |
| Definition | Indicates whether the substance quantity (used for ingredients) are absolute values or values relative to each other (percentages) |
| Control | 0..1 |
| Binding | SubstanceQuantityMode : valueset-substance-mode |
| Type | CodeableConcept from SubstanceQuantityMode |

## 5.53: Resource Formal Definitions: Supply

The formal definitions for the [Supply (§3.45)](http://hl7.org/implement/standards/fhir/fhir-book.htm#supply) resource.

|  |  |
| --- | --- |
| **Supply** | |
| Definition | A supply - request and provision |
| Control | 1..1 |
| **Supply.name** | |
| Definition | Category of supply |
| Control | 0..1 |
| Binding | SupplyType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-type)) |
| Type | CodeableConcept from SupplyType |
| **Supply.identifier** | |
| Definition | Unique identifier for this kind of supply |
| Control | 0..1 |
| Type | Identifier |
| Comments | This is assigned by the orderer, and used to refer to this order in other external standards |
| **Supply.status** | |
| Definition | Status of the supply |
| Control | 0..1 |
| Binding | SupplyStatus : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-status)) |
| Type | code from SupplyStatus |
| **Supply.orderedItem** | |
| Definition | The item which was ordered |
| Control | 0..1 |
| Type | Resource(Medication|Substance|Device) |
| **Supply.patient** | |
| Definition | A link to a resource representing the person to whom the medication will be given. |
| Control | 0..1 |
| Type | Resource(Patient) |
| Comments | SubstanceAdministration->subject->Patient |
| **Supply.dispense** | |
| Definition | Indicates the details of the dispense event such as the days supply and quantity of a supply dispensed. |
| Control | 0..\* |
| **Supply.dispense.identifier** | |
| Definition | Identifier assigned by the dispensing facility. This is an identifier assigned outside FHIR. |
| Control | 0..1 |
| Type | Identifier |
| **Supply.dispense.status** | |
| Definition | A code specifying the state of the dispense event. |
| Control | 0..1 |
| Binding | SupplyStatus : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-status)) |
| Type | code from SupplyStatus |
| Must Understand | true |
| **Supply.dispense.type** | |
| Definition | Indicates the type of dispensing event that is performed. Examples include: Trial Fill, Completion of Trial, Partial Fill, Emergency Fill, Samples, etc. |
| Control | 0..1 |
| Binding | SupplyItemType : ([Value Set Definition (Known Broken Link - needs to be resolved)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-supply-item)) |
| Type | CodeableConcept from SupplyItemType |
| **Supply.dispense.quantity** | |
| Definition | The amount of supply that has been dispensed. Includes unit of measure. |
| Control | 0..1 |
| Type | Quantity |
| **Supply.dispense.suppliedItem** | |
| Definition | Identifies the medication or substance being dispensed. This is either a link to a resource representing the details of the medication or substance or a simple attribute carrying a code that identifies the medication from a known list of medications. |
| Control | 0..1 |
| Type | Resource(Medication|Substance|Device) |
| **Supply.dispense.supplier** | |
| Definition | The individual responsible for dispensing the medication |
| Control | 0..1 |
| Type | Resource(Practitioner) |
| **Supply.dispense.whenPrepared** | |
| Definition | The time the dispense event occurred. |
| Control | 0..1 |
| Type | Period |
| **Supply.dispense.whenHandedOver** | |
| Definition | The time the dispense event occurred. |
| Control | 0..1 |
| Type | Period |
| **Supply.dispense.destination** | |
| Definition | Identification of the facility/location where the Supply was shipped to, as part of the dispense event. |
| Control | 0..1 |
| Type | Resource(Location) |
| **Supply.dispense.receiver** | |
| Definition | Identifies the person who picked up the Supply. |
| Control | 0..\* |
| Type | Resource(Practitioner) |

## 5.54: Resource Formal Definitions: ValueSet

The formal definitions for the [ValueSet (§3.46)](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset) resource.

|  |  |
| --- | --- |
| **ValueSet** | |
| Definition | A value set specifies a set of codes drawn from one or more code systems |
| Control | 1..1 |
| Invariants | **Defined on this element** **Inv-2**: A value set with only one import must also have an include and/or an exclude unless the value set defines its own codes (xpath: not(exists(f:compose)) or (count(f:compose/f:import)!=1 or exists(f:compose/f:include) or exists(f:compose/f:exclude) or exists(f:define))) **Inv-5**: Value set must contain either a define, a compose, or an expansion element (xpath: exists(f:define) or exists(f:compose) or exists(f:expansion)) **Inv-7**: A defined code system (if present) must have a different identifier to the value set itself (xpath: not(exists(f:define)) or (f:define/f:system/@value != f:identifier/@value)) |
| **ValueSet.identifier** | |
| Definition | The identifier that is used to identify this value set when it is referenced in a specification, model, design or an instance (should be globally unique OID, UUID, or URI) |
| Control | 0..1 |
| Type | string |
| Summary | true |
| **ValueSet.version** | |
| Definition | The identifier that is used to identify this version of the value set when it is referenced in a specification, model, design or instance. This is an arbitrary value managed by the profile author manually and the value should be a timestamp |
| Control | 0..1 |
| Type | string |
| Summary | true |
| Comments | There may be multiple resource versions of the value set that have this same identifier |
| **ValueSet.name** | |
| Definition | A free text natural language name describing the value set |
| Control | 1..1 |
| Type | string |
| Requirements | Support human navigation |
| Summary | true |
| Comments | Not expected to be unique |
| **ValueSet.publisher** | |
| Definition | The name of the individual or organization that published the value set |
| Control | 0..1 |
| Type | string |
| Requirements | Helps establish the "authority/credibility" of the profile. May also allow for contact |
| Summary | true |
| Comments | Usually an organization, but may be an individual. This item SHOULD be populated unless the information is available from context. |
| **ValueSet.telecom** | |
| Definition | Contacts of the publisher to assist a user in finding and communicating with the publisher |
| Control | 0..\* |
| Type | Contact |
| Summary | true |
| Comments | May be a web site, an email address, a telephone number (tel:), etc. |
| **ValueSet.description** | |
| Definition | A free text natural language description of the use of the value set - reason for definition, conditions of use, etc. |
| Control | 1..1 |
| Type | string |
| Requirements | Human understandibility |
| Summary | true |
| Comments | The description is not intended to describe the semantics of the Value Set - there are no intrinsic semantics separate from the codes contained in its expansion. The description should capture its intended use, which is needed for ensuring integrity for its use in models across future changes. |
| **ValueSet.status** | |
| Definition | The status of the value set |
| Control | 1..1 |
| Binding | ValueSetStatus : The lifecycle status of a Value Set (see [http://hl7.org/fhir/valueset-status](http://hl7.org/implement/standards/fhir/fhir-book.htm#valueset-status) for values) |
| Type | code from ValueSetStatus |
| Must Understand | true |
| Requirements | Identify when/if the value set should be used. |
| Summary | true |
| Comments | Allows filtering of valuesets that are appropriate for use vs. not |
| **ValueSet.experimental** | |
| Definition | This valueset was authored for testing purposes (or education/evaluation/marketing), and is not intended to be used for genuine usage |
| Control | 0..1 |
| Type | boolean |
| Summary | true |
| Comments | Allows filtering of valuesets that are appropriate for use vs. not |
| **ValueSet.date** | |
| Definition | The date that the value set status was last changed |
| Control | 0..1 |
| Type | dateTime |
| Requirements | Need to know when a value set was first legal for use or became withdrawn or replaced. |
| Summary | true |
| Comments | Note that this is not the same as the resource last-modified-date, since the resource may be a secondary representation of the value set |
| **ValueSet.define** | |
| Definition | When value set defines its own codes |
| Control | 0..1 |
| Invariants | **Affect this element** **Inv-5**: Value set must contain either a define, a compose, or an expansion element (xpath: exists(f:define) or exists(f:compose) or exists(f:expansion)) |
| **ValueSet.define.system** | |
| Definition | URI to identify the code system |
| Control | 1..1 |
| Type | uri |
| **ValueSet.define.caseSensitive** | |
| Definition | If code comparison is case sensitive when codes within this system are compared to each other |
| Control | 0..1 |
| Type | boolean |
| Comments | If this value is missing, then it is not specified whether a code system is case sensitive or not. When the rule is not known, Postel's law should be followed: produce codes with the correct case, and accept codes in any case. This element is primarily provided to support validation software |
| **ValueSet.define.concept** | |
| Definition | Concepts in the code system |
| Control | 0..\* |
| **ValueSet.define.concept.code** | |
| Definition | Code that identifies concept |
| Control | 1..1 |
| Type | code from ! |
| **ValueSet.define.concept.abstract** | |
| Definition | If this code is not for use as a real concept |
| Control | 0..1 |
| Type | boolean |
| **ValueSet.define.concept.display** | |
| Definition | Text to Display to the user |
| Control | 0..1 |
| Type | string |
| **ValueSet.define.concept.definition** | |
| Definition | Formal Definition |
| Control | 0..1 |
| Type | string |
| **ValueSet.define.concept.concept** | |
| Definition | Child Concepts (is-a / contains) |
| Control | 0..\* |
| Type | @ValueSet.define.concept |
| **ValueSet.compose** | |
| Definition | When value set includes codes from elsewhere |
| Control | 0..1 |
| Invariants | **Defined on this element** **Inv-1**: A value set composition must have an include or an import (xpath: exists(f:include) or exists(f:import))**Affect this element** **Inv-5**: Value set must contain either a define, a compose, or an expansion element (xpath: exists(f:define) or exists(f:compose) or exists(f:expansion)) |
| **ValueSet.compose.import** | |
| Definition | Includes the contents of the referenced value set as part of the contents of this value set |
| Control | 0..\* |
| Type | uri |
| Invariants | **Affect this element** **Inv-1**: A value set composition must have an include or an import (xpath: exists(f:include) or exists(f:import)) |
| **ValueSet.compose.include** | |
| Definition | Include one or more codes from a code system |
| Control | 0..\* |
| Comments | If there are no codes or filters, the entire code system is included |
| Invariants | **Affect this element** **Inv-1**: A value set composition must have an include or an import (xpath: exists(f:include) or exists(f:import)) |
| **ValueSet.compose.include.system** | |
| Definition | The code system from which the selected codes come from |
| Control | 1..1 |
| Type | uri |
| Comments | See [[Coding.system]] for further documentation |
| **ValueSet.compose.include.version** | |
| Definition | The version of the code system that the codes are selected from |
| Control | 0..1 |
| Type | string |
| Comments | This is used when selecting the descendents of a concept - they may change between versions. If no version is specified, then the exact contents of the value set may not be known until a context of use binds it to a particular version |
| **ValueSet.compose.include.code** | |
| Definition | Specifies a code or concept to be included or excluded |
| Control | 0..\* |
| Type | code from ! |
| Comments | expressions are allowed if defined by the underlying code system |
| **ValueSet.compose.include.filter** | |
| Definition | Select concepts by specify a matching criteria based on the properties (including relationships) defined by the system. If multiple filters are specified, they must all be true. |
| Control | 0..\* |
| Comments | Selecting codes by specifying filters based on properties is only possible where the underlying code system defines appropriate properties. Note that in some cases, the underlying code system defines the logical concepts but not the literal codes for the concepts. In such cases, the literal definitions may be provided by a third party |
| **ValueSet.compose.include.filter.property** | |
| Definition | A code that identifies a property defined in the code system |
| Control | 1..1 |
| Type | code from ! |
| **ValueSet.compose.include.filter.op** | |
| Definition | The kind of operation to perform as part of the filter criteria |
| Control | 1..1 |
| Binding | FilterOperator : The kind of operation to perform as part of a property based filter (see [http://hl7.org/fhir/filter-operator](http://hl7.org/implement/standards/fhir/fhir-book.htm#filter-operator) for values) |
| Type | code from FilterOperator |
| **ValueSet.compose.include.filter.value** | |
| Definition | The match value may be either a code defined by the system, or a string value which is used a regex match on the literal string of the property value |
| Control | 1..1 |
| Type | code from ! |
| Comments | Use regex matching with care - full regex matching on every SNOMED-CT term is prohibitive, for example |
| **ValueSet.compose.exclude** | |
| Definition | Exclude one or more codes from the value set |
| Control | 0..\* |
| Type | @ValueSet.compose.include |
| Comments | usually this is used to selectively exclude codes that were included by subsumption in the inclusions |
| Invariants | **Affect this element** **Inv-2**: A value set with only one import must also have an include and/or an exclude unless the value set defines its own codes (xpath: not(exists(f:compose)) or (count(f:compose/f:import)!=1 or exists(f:compose/f:include) or exists(f:compose/f:exclude) or exists(f:define))) |
| **ValueSet.expansion** | |
| Definition | When value set is an expansion |
| Control | 0..1 |
| Invariants | **Affect this element** **Inv-5**: Value set must contain either a define, a compose, or an expansion element (xpath: exists(f:define) or exists(f:compose) or exists(f:expansion)) |
| **ValueSet.expansion.timestamp** | |
| Definition | Time valueset expansion happened |
| Control | 1..1 |
| Type | instant |
| **ValueSet.expansion.contains** | |
| Definition | Codes in the value set |
| Control | 0..\* |
| Invariants | **Defined on this element** **Inv-6**: Must have a code or a display (xpath: exists(f:code) or exists(f:display)) |
| **ValueSet.expansion.contains.system** | |
| Definition | System value for the code |
| Control | 0..1 |
| Type | uri |
| **ValueSet.expansion.contains.code** | |
| Definition | Code - if blank, this is not a choosable code |
| Control | 0..1 |
| Type | code from ! |
| Invariants | **Affect this element** **Inv-6**: Must have a code or a display (xpath: exists(f:code) or exists(f:display)) |
| **ValueSet.expansion.contains.display** | |
| Definition | User display for the concept |
| Control | 0..1 |
| Type | string |
| Invariants | **Affect this element** **Inv-6**: Must have a code or a display (xpath: exists(f:code) or exists(f:display)) |
| **ValueSet.expansion.contains.contains** | |
| Definition | Codes contained in this concept |
| Control | 0..\* |
| Type | @ValueSet.expansion.contains |

**Warning: FHIR is a draft specification that is still undergoing development prior to balloting as a full HL7 standard**   
Implementers are welcome to experiment with the content defined here, but should note that the contents are subject to change without prior notice.  
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