**Integrating the Healthcare Enterprise**



**IHE Patient Care Coordination**

**Technical Framework Supplement**

**Dynamic Care Planning**

**(DCP)**

HL7® FHIR® STU 4

Using Resources at FMM Level 2-3

**Revision X.1 – ???**

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**Please verify that you have the most recent version of this document.** See [here](http://ihe.net/Technical_Frameworks/) for Trial Implementation and Final Text versions and [here](http://ihe.net/Public_Comment/) for Public Comment versions.

**Foreword**

This is a supplement to the IHE Patient Care Coordination Technical Framework. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on September 13, 2018 for trial implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the Patient Care Coordination Technical Framework. Comments are invited and can be submitted at [http://www.ihe.net/PCC\_Public\_Comments](http://www.ihe.net/PCC_Public_Comments/).

This supplement describes changes to the existing technical framework documents.

“Boxed” instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume.

Amend Section X.X by the following:

Where the amendment adds text, make the added text bold underline. Where the amendment removes text, make the removed text bold strikethrough. When entire new sections are added, introduce with editor’s instructions to “add new text” or similar, which for readability are not bolded or underlined.

General information about IHE can be found at [http://ihe.net](http://ihe.net/).

Information about the IHE Patient Care Coordination domain can be found at [http://ihe.net/IHE\_Domains](http://ihe.net/IHE_Domains/).

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at [http://ihe.net/IHE\_Process](http://ihe.net/IHE_Process/) and [http://ihe.net/Profiles](http://ihe.net/Profiles/).

The current version of the IHE Patient Care Coordination Technical Framework can be found at [http://ihe.net/Technical\_Frameworks](http://ihe.net/Technical_Frameworks/).

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# Introduction to this Supplement

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Whenever possible, IHE profiles are based on established and stable underlying standards. However, if an IHE committee determines that an emerging standard offers significant benefits for the use cases it is attempting to address and has a high likelihood of industry adoption, it may develop IHE profiles and related specifications based on such a standard.  The IHE committee will take care to update and republish the IHE profile in question as the underlying standard evolves. Updates to the profile or its underlying standards may necessitate changes to product implementations and site deployments in order for them to remain interoperable and conformant with the profile in question.  This DCP Profile uses the emerging HL7®[[1]](#footnote-1) FHIR®[[2]](#footnote-2) specification. The FHIR release profiled in this supplement is STU ?. HL7 describes the STU (Standard for Trial Use) standardization state at <https://www.hl7.org/fhir/versions.html>.  In addition, HL7 provides a rating of the maturity of FHIR content based on the FHIR Maturity Model (FMM): level 0 (draft) through 5 (normative ballot ready). The FHIR Maturity Model is described at [http://hl7.org/fhir/http://hl7.org/fhir/versions.html#maturity](http://hl7.org/fhir/versions.html" \l "maturity).  Key FHIR STU 3 content, such as Resources or ValueSets, used in this profile, and their FMM levels are:   |  |  | | --- | --- | | FHIR Resource Name | FMM Level | | CarePlan | ?? | | Subscription | ?? | | PlanDefinition | ?? | | ActivityDefinition | ?? | | Task | ?? | | CareTeam | ?? | | CommunicationRequest | ?? | | Communication | ?? |   **Comments on the FHIR Resources**  The PCC Technical Committee welcomes your comments on the above resources. Links to them are available from the DCP Profile wiki page at [http://wiki.ihe.net/index.php/Dynamic\_Care\_Planning#FHIR\_Implementation\_Guide](http://wiki.ihe.net/index.php/Dynamic_Care_Planning" \l "FHIR_Implementation_Guide) |

The Dynamic Care Planning (DCP) Profile provides the structures and transactions for care planning and sharing Care Plans that meet the needs of many, such as providers, patients and payers. Care Plans can be dynamically updated as the patient interacts with the healthcare system. HL7 FHIR resources and transactions are used by this profile. This profile does not define, nor assume, a single Care Plan for a patient.

Updates to this profile will provide a mechanism to facilitate system interactions to support care team membership while care planning. Care team membership include support for:

* Adding Care Team Members
* Removing Care Team Members
* Request Participation
* Respond to Participation Request

The use of IHE XDW constructs were discussed as an implementation option for dynamic care planning. Use of XDW constructs was not part of the initial scope for this profile. However, IHE PCC is interested in providing support for XDW implementer if this is of interest as a future consideration. Please see Volume 3 Appendix 7 for proposed DCP to XDW mappings that is being explored as a future option.

## Open Issues and Questions

1. Seeking feedback: Are there systems/applications in existence today where the primary duty of that system is to manage care teams by creating, updating care teams including identifying specific individuals that are fulfilling care team roles?
2. How does XDW Care Planning workflow relate to DCP? Is there interest in developing XDW Care Planning constructs?
3. Is an ATNA Grouping required? If so, how does that impact potential mobile uses of this profile?
4. When profiling the FHIR Resource make sure we can make references to existing documents (e.g., CDA documents, XDW documents, etc.).
5. Concepts from the Care Plan model, DAM or C-CDA, do not have clear mappings to the FHIR CarePlan resource.
6. The following tracker items submitted to FHIR to Make $apply a resource operation as well as an instance operation (for both ActivityDefinition and PlanDefinition) – See 3.63 Update Plan Definition [PCC-63]

<https://gforge.hl7.org/gf/project/fhir/tracker/?action=TrackerItemEdit&tracker_item_id=17437>

<https://gforge.hl7.org/gf/project/fhir/tracker/?action=TrackerItemEdit&tracker_item_id=17395>

Open issue is to determine if FHIR will update STU 3 or provide this change as STU 4.

Note: Changes have been made in build.fhir.org – See

http://build.fhir.org/plandefinition-operation-apply.html

<http://build.fhir.org/activitydefinition-operation-apply.html>

## Closed Issues

1. 2/15/16 Scope: This profile will not attempt to ‘discover’ all possible providers that have provided care for the patient. …this means that information on the location of actors is not profiled and is obtained by methods outside of the scope of this profile (similar to how XDS actors know with whom they communicate).
2. (2/16/16) The Care Plan Contributor should use the following pattern, from [http://hl7.org/fhir/STU3/http.html#transactional-integrity](http://hl7.org/fhir/http.html" \l "transactional-integrity)

* The server provides a [read](http://hl7.org/fhir/http.html" \l "read) interaction for any resource it accepts [update](http://hl7.org/fhir/http.html" \l "update) interactions on
* Before updating, the client [reads](http://hl7.org/fhir/http.html" \l "read) the latest version of the resource
* The client applies the changes it wants to the resource, leaving other information intact (note the [extension related rules](http://hl7.org/fhir/extensibility.html" \l "exchange) around this)
* The client writes the result back as an [update](http://hl7.org/fhir/http.html" \l "update) interaction, and is able to handle a 409 or 412 response (usually by trying again)

If clients follow this pattern, then information from other systems that they do not understand will be maintained through the update.

Note that it's possible for a server to choose to maintain the information that would be lost, but there is no defined way for a server to determine whether the client omitted the information because it wasn't supported (perhaps in this case) or whether it wishes to delete the information.

1. (3/28/16) Does FHIR Search using POST create a resource when the search fails to match on the search criteria?  
   No, the search operation, indicated by \_search, does not cause creation of content on the server.
2. (7/18/16) Should the FHIR CarePlan.subject be restricted to Patient?
3. What does CarePlan.subject of type Group mean?

In behavioral science where "Group" can be family, disaster victim/survivor group, defense or police force groups

Example: treatment of PTSD in these groups requires observation and management of group dynamics

In public health where "Group" can be family, community, residents of certain floors or entire building, airplane/cruise passenger cohort

Example: tracking, monitoring and managing communicable diseases outbreak in these groups

1. (closed 8/24/2017) Need to determine the FHIR version and what to do about future updates.

See Introduction to this Supplement section.

1. (closed on 2/15/16) This profile will not attempt to ‘discover’ all possible providers that have provided care for the patient. There are other means of discovering patient’s points of care such as state HIE services, Nationwide Health Information Network (NwHIN) and CommonWell Health Alliance. This profile will account for known providers that have provided care for the patient.
2. (closed 8/24/2017) The modeling of the Care Team is changing with newer versions of FHIR. How do we handle these changes?

See Introduction to this Supplement section.

1. (Closed 12/20/2017) Differing "roles" on the Care Team will likely be needed. We stated in the open issues that representation of the Care Team is not well defined yet and still needs to be addressed.
2. (Closed 02/12/2018) The CarePlan resource includes activity.actionResulting – need understanding how this related to Care Plan concepts. The activity.actionResulting element has been changed to activity.outcomeReference in the CarePlan resource. The basedOn element fulfills the outcomeReference. For example, procedure.basedOn fulfills the request for the procedure.
3. Care Plan Contributor vs. Content Creator

(Closed 03/05/2018) These two actors were examined extensively as a possibility for executing ActivityDefinitions during the care planning process. Based on the understanding that Content Creator (and Content Consumer) is very document centric (i.e., deals with executing a document exchange workflow), it was decided that use of Content Creator and Content Consumer Actors introduces confusing to the care planning workflow as currently used in this profile.

1. (Closed 05/01/2018) CP 0228 - Ballot comment from Philips Health Care - All links to FHIR STU3 specification should be using http://hl7.org/fhir/STU3/ as the base URL. http://hl7.org/fhir/ may change as a new STU version is created.
2. (Closed 05/02/2018) Describe what “as initiator” from the actor description means in volume 2 (if not already there). ‘Initiator’ removed from the profile because it is causing confusion.

# General Introduction

Update the following Appendices to the General Introduction as indicated below. Note that these are not appendices to Volume 1.

# Appendix A – Actor Summary Definitions

Add the following **new** actors to the IHE Technical Frameworks General Introduction list of actors:

|  |  |
| --- | --- |
| Actor | Definition |
| Care Plan Contributor | This actor reads, creates and updates Care Plans hosted on a Care Plan Service. This actor reads, creates and updates Plan Definitions hosted on a Care Plan Definition Service. This actor generates Care Plans and subsequently generate request resources based on selected activity definition associated with the plan definition based on business rules. |
| Care Plan Service | This actor manages Care Plans received from Care Plan Contributors and provides updated Care Plans to subscribed Care Plan Contributors. |
| Care Plan Definition Service | This actor manages Plan Definition received from Care Plan Contributors and provides updated Plan Definitions to subscribed Care Plan Contributors. |
| Care Team Contributor | This actor reads, creates and updates Care Teams hosted by a Care Team Service. |
| Care Team Service | This actor manages Care Teams received from Care Team Contributors and provides notification of updates and access to updated Care Teams to subscribers. |

# Appendix B – Transaction Summary Definitions

Add the following **new** transactions to the IHE Technical Frameworks General Introduction list of Transactions:

|  |  |
| --- | --- |
| Transaction | Definition |
| Update Care Plan [PCC-37] | Update an existing or create a new Care Plan |
| Retrieve Care Plan [PCC-38] | Retrieve a Care Plan |
| Subscribe to Care Plan Updates [PCC-39] | Subscribe to receive updated Care Plans for specific patients |
| Provide Care Plan [PCC-40] | Provide updated Care Plans to subscribers |
| Search for Care Plan [PCC-41] | Used to find a Care Plan |
| Search for Plan Definition [PCC-65] | Used to find a Plan Definition |
| Retrieve Plan Definition [PCC-64] | Retrieve a Plan Definition |
| Update Plan Definition [PCC-63] | Update an existing or create a new Plan Definition |
| Subscribe to Plan Definition updates [PCC-66] | Subscribe to receive updated Plan Definitions for specific conditions |
| Provide Plan Definition [PCC-67] | Provide updated Plan Definition to subscribers |
| Provide Activity Definition [PCC-68] | Provide applicable Activity Definition |
| Apply Activity Definition Operation [PCC-69] | Generates a Care Plan and subsequent request resources based on business rules |
| Update Care Team [PCC TF-2: 3.45] | Used to update or to create a Care Team |
| Search for Care Team [PCC TF-2: 3.46] | Used to find a Care Team |
| Retrieve Care Team [PCC TF-2: 3.47] | Retrieve a specific Care Team |
| Provide Care Team [PCC TF-2: 3.49] | Provide an updated Care Team to subscribers |
| Subscribe to Care Team Updates [PCC TF-2: 3.48] | Subscribe to updates made to a Care Team for specific patients |

# Glossary

Add the following **new** glossary terms to the IHE Technical Frameworks General Introduction Glossary:

| Glossary Term | Definition |
| --- | --- |
| Care Plan Domain Analysis Model | A common reference used to support the development of implementable care plan models[[3]](#footnote-3) |
| Coordination of Care Services Functional Model | Supports shared and coordinated care plans as well as support of multidisciplinary care team members to communicate changes resulting from care plan interventions and collaborate in removing barriers to care.[[4]](#footnote-4) |
| Care Plan | Tool used by clinicians to plan and coordinate care for an individual patient. It aids in understanding and coordinating the actions that need to be performed for the target of care. The care plan is known by several similar and often interchangeable names such as the plan of care and treatment plan.[[5]](#footnote-5) |
| Plan Definition | Contain action definition which describes an activity to be performed[[6]](#footnote-6). |
| Activity Definition | Specific actions to be performed as part of care planning.[[7]](#footnote-7) |
| Care Team Domain Analysis Model (DAM) | Captures the roles and relationships of the unique group pf individuals who provide care for a single patient. [[8]](#footnote-8) |
| Communication Request (as used in this profile) | Record of a request for a communication to be performed.[[9]](#footnote-9) |
| Communication (as used in this profile) | Record of a communication that has occurred.[[10]](#footnote-10) |
| Care Team | Party who manages and/or provides care or service as specified and agreed to in the care plan, including clinicians, other paid and informal caregivers, communication sponsor and the patient. Note: In some settings, the Care Team is a separate group of people whose responsibility it is to formalize a care plan and possibly even to implement or coordinate its implementation. This group of people may or may not include any or all members of the patient’s rendering team of healthcare professionals. Members of the Care Team are typically selected because of their comprehensive knowledge of the patient’s condition(s) and/or due to their knowledge of the healthcare business rules governing aspects of patient care or its financing. For this reason, the term Care Team is capitalized to indicate the specific group of individuals who create the content of the structured document referred to as care plan.[[11]](#footnote-11) |
| Clinical Care Team | A clinical care team for a given patient consists of the health professionals—physicians, advanced practice registered nurses, other registered nurses, physician assistants, clinical pharmacists, and other health care professionals—with the training and skills needed to provide high-quality, coordinated care specific to the patient's clinical needs and circumstances.[[12]](#footnote-12) |
| Care Team Management | Parties who manage and/or provide care or service as specified and agreed to in the Care Plan, including: clinicians (including providers), other paid and informal caregivers, and the patient. Care Team Members may include individuals who do not provide direct care such as a Care Manager.[[13]](#footnote-13)  As a point of differentiation, note that care team management is a process, whereas care manager is a participant role. |
| Encounter-focused Care Team | This type of team focuses on one specific encounter. The encounter is determined by the context of use.[[14]](#footnote-14) |
| Episode-focused Care Team | This type of team focuses on one specific episode of care. The episode of care is determined by the context of use.[[15]](#footnote-15) |
| Condition-focused Care Team | This type of team focuses on one specific condition. The condition is determined by the context of use.[[16]](#footnote-16) |
| Care-coordination focused Care Team | This type of team focuses on overall care coordination. The members of the team are determined or selected by an individual or organization. When determined by an organization, the team may be assigned or based on the person’s enrollment in a particular program.[[17]](#footnote-17) |
| Research-focused Care Team | Patients enrolled in a clinical trial may have a team that is part of that clinical trial. In many cases that team may be involved in interventions that are part of the protocol for that clinical trial and often related to a primary diagnosis of the patient, such as a chemotherapy trial for a cancer patient. That research team may include a provider whom the patient was already engaged with or the patient may have been referred to the clinical trial or enrolled on their own volition. Team members might include a principal investigator, sub-investigator, research coordinator site coordinator, research nurse, or others involved in conducting the trial.[[18]](#footnote-18) |
| Utilization Review | A critical evaluation (as by a physician or nurse) of health-care services provided to patients that is made especially for the purpose of controlling costs and monitoring quality of care.[[19]](#footnote-19) |
|  |  |
|  |  |
|  |  |

Volume 1 – Profiles

## Copyright Licenses

NA

Add the following to the IHE Technical Frameworks General Introduction Copyright section:

## Domain-specific additions

NA

Add Section X

# X Dynamic Care Planning (DCP) Profile

The Dynamic Care Planning (DCP) Profile provides the structures and transactions for care planning and sharing Care Plans that meet the needs of many, such as providers, patients and payers. Care Plans can be dynamically created from tools used to support evidence-base practice. These care plans can be updated as the patient interacts with the healthcare system. HL7 FHIR resources and transactions are used by this profile. This profile does not define, nor assume, a single Care Plan for a patient.

Globally, the healthcare system is highly fragmented. Fragmentation can increase the number of hospital re-admissions. According to claims data reported for the Medicare beneficiaries in 2003-2004, 19.6% of re-hospitalizations occur within 30 days after discharge. This translated into $17.4 billion dollars in hospital payments from Medicare in 2004.[[20]](#footnote-20)

The numbers of service delivery encounters required by individuals as well as the failure to deliver and coordinate needed services, are significant sources of frustration and errors, and are drivers of health care expenditures. Providing person-centered care is particularly important for medically-complex and/or functionally impaired individuals given the complexity, range, and on-going and evolving nature of their health status and the services needed. Effective, collaborative partnerships between service providers and individuals are necessary to ensure that individuals have the ability to participate in planning their care and that their wants, needs, and preferences are respected in health care decision making. The ability to target appropriate services and to coordinate care over time, across multiple clinicians and sites of service, with the engagement of the individual (i.e., longitudinal coordination of care) is essential to alleviating fragmented, duplicative and costly care for these medically-complex and/or functionally impaired persons. To this end, care planning can provide guidance for care team management by directing the coordinated care team members activities.[[21]](#footnote-21)

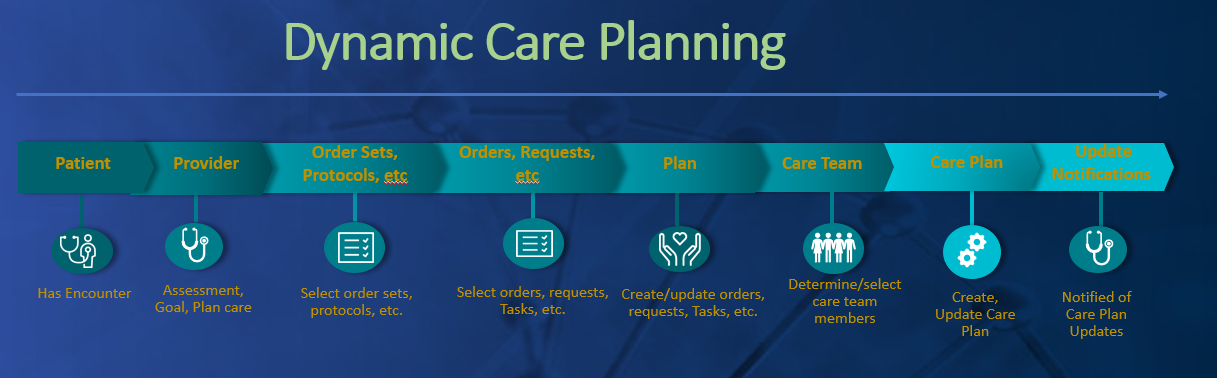


Figure X-1: Dynamic Care Planning Workflow Example

## X.1 DCP Actors, Transactions, and Content Modules

This section defines the actors, transactions, and/or content modules in this profile. General definitions of actors are given in the Technical Frameworks General Introduction Appendix A at [http://ihe.net/Technical\_Frameworks](http://ihe.net/Technical_Frameworks/).

Figure X.1-1 shows the actors directly involved in the DCP Profile and the relevant transactions between them. If needed for context, other actors that may be indirectly involved due to their participation in other related profiles are shown in dotted lines. Actors which have a mandatory grouping are shown in conjoined boxes.

Care Plan Definition Service

Care Plan Contributor

Care Plan Service

↓ Search for Plan Definition [PCC-65]

↓ Retrieve Plan Definition [PCC-64]

↓Update Plan Definition [PCC-63]

↓ Subscribe to Plan Definition Updates [PCC-66]

↑ Provide Plan Definition [PCC-67]

↑ Provide Activity Definition [PCC-68]

↓Apply Activity Definition Operation [PCC – 69]

↓Update Care Plan [PCC-37]

↓ Search for Care Plan [PCC-41]

↓ Retrieve Care Plan [PCC-38]

↓ Subscribe to Care Plan Updates [PCC-39]

↑ Provide Care Plan [PCC-40]

Care Team Contributor

Care Team Service

↓Update Care Team [PCC-45]

↓ Search for Care Team [PCC-46]

↓ Retrieve Care Team [PCC-47]

↓ Subscribe to Care Team Updates [PCC-48]

 ↑ Provide Care Team [PCC-49]

Figure X.1-1: DCP Actor Diagram

Table X.1-1: DCP Profile - Actors and Transactions

| Actors | Transactions | Optionality | Reference |
| --- | --- | --- | --- |
| Care Plan Contributor | Update Care Plan | R | PCC TF-2: 3.37 |
| Search for Care Plan | R | PCC TF-2: 3.41 |
| Retrieve Care Plan | R | PCC TF-2: 3.38 |
| Subscribe to Care Plan Updates | O | PCC TF-2: 3.39 |
| Provide Care Plan | O | PCC TF-2: 3.40 |
| Search for Plan Definition | O | PCC TF-2: 3.65 |
| Retrieve Plan Definition | O | PCC TF-2: 3.64 |
| Update Plan Definition | O | PCC TF-2: 3.63 |
| Subscribe to Plan Definition Updates | O | PCC TF-2: 3.66 |
| Apply Activity Definition Operation | O | PCC TF-2: 3.69 |
| Care Team Contributor | Update Care Team | R | PCC TF-2: 3.45 |
| Search for Care Team | R | PCC TF-2: 3.46 |
| Retrieve Care Team | R | PCC TF-2: 3.47 |
| Subscribe to Care Team Updates | O Note 1 | PCC TF-2: 3.48 |
| Provide Care Team | O | PCC TF-2: 3.49 |
| Care Plan Service | Search for Care Plan | R | PCC TF-2: 3.41 |
| Update Care Plan | R | PCC TF-2: 3.37 |
| Retrieve Care Plan | R | PCC TF-2: 3.38 |
| Subscribe to Care Plan Updates | R | PCC TF-2: 3.39 |
| Provide Care Plan | R | PCC TF-2: 3.40 |
| Care Team Service | Search for Care Team | R | PCC TF-2: 3.46 |
| Retrieve Care Team | R | PCC TF-2: 3.47 |
| Update Care Team | R | PCC TF-2: 3.45 |
| Subscribe to Care Team Updates | R | PCC TF-2: 3.48 |
| Provide Care Team | R (as initiator) | PCC TF-2: 3.49 |
| Care Plan Definition Service | Search for Plan Definition | R | PCC TF-2: 3.65 |
| Provide Plan Definition | R | PCC TF-2: 3.67 |
| Provide Activity Definition | R | PCC TF-2: 3.68 |
| Update Plan Definition | R | PCC TF-2: 3.63 |
| Retrieve Plan Definition | R | PCC TF-2: 3.64 |
| Subscribe to Plan Definition Updates | R | PCC TF-2: 3.66 |

Note 1: If the Subscribe to Care Team Updates Option is supported, must also support Provide Care Team Option

Table X.1-1 lists the transactions for each actor directly involved in the DCP Profile. To claim compliance with this profile, an actor shall support all required transactions (labeled “R”) and may support the optional transactions (labeled “O”).

### X.1.1 Actor Descriptions and Actor Profile Requirements

Most requirements are documented in Transactions (Volume 2) and Content Modules (Volume 3). This section documents any additional requirements on profile’s actors.

There are five actors in this profile. The first actor is the Care Plan Contributor. This actor interacts with both the Care Plan Service and the Care Plan Definition Service. This actor creates and updates the care plan. This actor also acts on the request or task resources as part of the care planning process.

The second actor is the Care Team Contributor. This actor is grouped with the Care Plan Contributor actor to support the care team workflow as a component of care planning. This actor interacts with the Care Team Service to create and update the care team aspects of the care plan.

The third actor is the Care Plan Service. This actor manages patient specific Care Plans.

The fourth actor is the Care Team Service. This actor manages Care Team updates.

The fifth actor is the Care Plan Definition Service. This actor manages Plan Definitions that are used for order sets, protocols, clinical practice guidelines, etc.

Each actor is described in detail below.

#### X.1.1.1 Care Plan Contributor

This actor does the following two things:

1. Reads, creates and updates Care Plans hosted by a Care Plan Service.
2. Reads, creates and updates Plan Definitions (e.g., order sets, protocols, etc.) hosted by a Care Plan Definition Service.
3. Applies Activity Definitions when the care plan is created and/or updated

In order to ensure data integrity, as is necessary when multiple Care Plan Contributors are attempting to update the same Care Plan, the Care Plan Contributor SHALL use the following pattern, (from http://hl7.org/fhir/STU3/http.html#transactional-integrity)

* Before updating, the Care Plan Contributor SHALL read the latest version of the Care Plan;
* The Care Plan Contributor SHALL apply the changes (additions, updates, deletions) it wants to the Care Plan, leaving all other information intact;
* The Care Plan Contributor SHALL write the Care Plan back as an update interaction, and is able to handle a failure response, commonly due to other Contributor Updates (usually by trying again).

The same pattern SHALL be used when multiple Care Plan Contributors are updating the same Plan Definition hosted by a Care Plan Definition Service.

* Before updating, the Care Plan Contributor SHALL read the latest version of the Plan Definition;
* The Care Plan Contributor SHALL apply the changes (additions, updates, deletions) it wants to the Plan Definition, leaving all other information intact;
* The Care Plan Contributor SHALL write the Plan Definition back as an update interaction, and is able to handle a failure response, commonly due to other Contributor Updates (usually by trying again).

If a Care Plan Contributor follows this pattern, then information from other systems that they do not manage will be maintained through the update.

#### X.1.1.2 Care Team Contributor

This actor reads, creates and updates CareTeam resources hosted by a Care Team Service FHIR server in accordance with changes in the care team. Updates include removal of participants by removing the respective CareTeam.participant.elements. The CareTeam.participant.period element can be used to determine historical plus forward-looking aspects for members of the care team.

In order to ensure data integrity, as is necessary when multiple Care Team Contributor Actors are attempting to update to the same CareTeam resource, the Care Team Contributor SHALL use the following sequence of operations (from [http://hl7.org/fhir/http.html#transactional-integrity](http://hl7.org/fhir/http.html" \l "transactional-integrity)).

* Before updating, the Care Team Contributor SHALL read the latest version of the CareTeam resource;
* The Care Team Contributor SHALL apply the changes (additions, updates, deletions) it wants to the CareTeam resource, leaving all other information intact;
* The Care Team Contributor SHALL write the CareTeam resource back as an update interaction, and is able to handle a failure response, commonly due to other Contributor Updates (usually by trying again).

If a Care Team Contributor follows this pattern, then information from Care Team Contributor Actors on other systems will be maintained through the update

#### X.1.1.3 Care Plan Service

This actor manages Care Plans received from Care Plan Contributors and provides updated Care Plans to subscribers.

As described above under the Care Plan Contributor, the Care Plan Service receives a Care Plan and manages versions of the Care Plan as a whole. Note – the Care Plan Service SHALL support versioning of the CarePlan resource.

A Care Plan Service SHALL enable a Care Plan Contributor to unsubscribe from updates for a Care Plan.

#### X.1.1.4 Care Team Service

This actor manages Care Team Updates received from Care Team Contributors, and provides notification of updates and access to subscribers of CareTeam resource changes. Notifications are managed through the Subscription resource, also maintained on the Care Team Service FHIR server.

As described above under the Care Team Contributor, the Care Team Service receives Update Care Team transactions and manages versions of the CareTeam resource as a whole. Note – the Care Team Service FHIR server SHALL support versioning of the CareTeam resource. The versioning support allows one to obtain a full history of each CareTeam resource including the state of the resource at each stage.

#### X.1.1.5 Care Plan Definition Service

This actor manages Plan Definitions received from Care Plan Contributors and provides updated Plan Definitions to subscribers. Examples of Plan Definitions include order sets, protocols, clinical practice guidelines, decision support rules, etc.[[22]](#footnote-22)

As described above under the Care Plan Contributor, the Care Plan Definition Service receives a Plan Definition and manages versions of the Plan Definition as a whole. Note – the Plan Definition Service SHALL support versioning of the PlanDefinition resource.

A Care Plan Definition Service SHALL enable a Care Plan Contributor to unsubscribe from updates for a Plan Definition.

## X.2 DCP Actor Options

Options that may be selected for each actor in this profile, if any, are listed in Table X.2-1. Dependencies between options when applicable are specified in notes.

Table X.2-1: DCP - Actors and Options

| Actor | Option Name | Reference |
| --- | --- | --- |
| Care Plan Contributor | Subscribe to Care Plan Updates | 3.39 |
| Subscribe to Plan Definition Updates | 3.66 |
| Apply Activity Definition Operation | 3.69 |
| Care Team Contributor | Subscribe to Care Team Updates | 3.48 |
| Care Plan Service | No options defined | -- |
| Care Team Service | No options defined | -- |
| Care Plan Definition Service | No options defined | -- |

### X.2.1 Subscribe to Care Plan Updates

Support for this Subscribe to Care Plan Updates means that the optional Subscribe to Care Plan Updates [PCC-39] and the optional Provide Care Plan [PCC-40] are both supported.

The alternative to subscribing to care plan updates is a polling process, where a Care Plan Contributor would periodically query for a CarePlan resource history and determine that a Retrieve Care Plan was necessary.

### X.2.2 Subscribe to Plan Definition Updates

Support for this Subscribe to Plan Definition Updates means that the optional Subscribe to Plan Definition Updates [PCC-66] and the optional Provide Plan Definition [PCC-67] are both supported.

The alternative to subscribing to plan definition updates is a polling process, where a Care Plan Contributor would periodically query for a PlanDefinition resource history and determine that a Retrieve Plan Definition was necessary.

### X.2.3 Apply Activity Definition Operation

Support for this Apply Activity Definition Operation means that the optional Apply Activity Definition Operation [PCC-69] and the required Update Care Plan are both supported. The Apply Activity Definition Operation Option supports the generation of request or task resources as part of the care planning process. Request resources as defined by FHIR are “resources that represent a specific proposal, plan and/or order for some sort of action or service”.[[23]](#footnote-23) Request resources associated with the CarePlan.activity.reference are Appointment, CommunicationRequest, DeviceRequest, MedicationRequest, NutritionOrder, Task, ProcedureRequest, ReferralRequest , VisionPrescription, RequestGroup.

### X.2.4 Subscribe to Care Team Updates

Support for this Subscribe to Care Team Updates means that the optional Subscribe to Care Team Updates [PCC-48] and the optional Provide Care Team [PCC-49] are both supported.

The alternative to subscribing to CareTeam resource updates is a polling process, where a Care Team Contributor would periodically query for a CareTeam resource history and determine that a Retrieve Care Team is necessary.

## X.3 DCP Required Actor Groupings

Table X.3-1: DCP - Required Actor Groupings

| DCP Actor | Actor to be grouped with | Reference | Content Bindings Reference |
| --- | --- | --- | --- |
| Care Plan Contributor | Care Team Contributor |  |  |
| Care Plan Service | None |  |  |
| Care Plan Definition Service | none |  |  |

## X.4 DCP Overview

Care planning is needed to manage medically complex and/or functionally impaired individuals as they interact with the health care system. Often, these individuals require real time coordination of the care as they receive care from multiple care providers and care settings. HL7 Care Plan Domain Analysis Model (Care Plan DAM) depicts the care plan as a tool used by clinicians to plan and coordinate care[[24]](#footnote-24). Care planning is needed to manage medically complex and/or functionally impaired individuals as they interact with the health care system. Effective care planning requires the ability to include care provisions by care teams and care team members. Care teams and care team members are typically associated with the care they provide. This association supports the care planning aspects associated with the person for whom the care is provided. Often, care teams and care team members require real time coordination of care as individuals receive care from multiple care providers and care settings. These care providers make up patient centered collaborative focused care teams.

Effective care planning and care coordination for patients with complex health problems and needs are needed throughout the world. Both the European Union and the United States are currently working to encourage more effective use of information and communication technology to support the delivery of health services. This has led to the promotion of interoperability of health information and communication technology products and services.[[25]](#footnote-25)

HL7 Care Team Domain Analysis Model (DAM) provides a model that captures the roles and relationships of entities who provide care for an individual. These entities are considered to be a care team due to the fact that they participate in the care of the same individual. [[26]](#footnote-26)

In the United States, providers and payers are interested in ensuring that patients are receiving effective and efficient care. The Medicare and Medicaid EHR incentive programs provide financial incentives to care providers for the meaningful use of certified EHR technology that supports care coordination[[27]](#footnote-27). According to the United States Office of the National Coordinator for Health Information Technology’s Connecting Health and Care for the Nation Shared Nationwide Interoperability Roadmap, “Providers also play a critical role in coordinating care with other providers in support of patients. However, coordinating care and engaging with multi-disciplinary, cross-organization care, support and service teams has been incredibly difficult with the tools available today. Technology that does not facilitate the sharing and use of electronic health information that providers need, when they need it, which often creates additional challenges to care coordination. Additionally, care coordination via electronic means requires workflow changes for providers and their staff, particularly to close referral loops and ensure all of an individual’s health information is available to the entire care, support and services team. These workflow changes are not insignificant and must be overcome in order to enable interoperability.”[[28]](#footnote-28)

CP DAM recognizes that many clinical settings use multiple tools such as (templates, protocols, care pathways, ordersets) without regards of overlap or discrepancy in care planning[[29]](#footnote-29). This profile depicts how care plans can be created with the use of coordinated tools by using FHIR PlanDefinition. The Care Plan can then be shared and used to plan and coordinate care.

### X.4.1 Concepts

Care plans have many different meanings to many different people. Each discipline has its own definition of what a care plan is and what it contains. Dynamic care planning expands the concept of care planning from being only discipline specific to an interdisciplinary process where all disciplines that care for the patient are able to share their plans of care, treatment plans, health issues, interventions and goals/outcomes, etc. for the patient. For a view of the Shared Care Planning process, see <ftp://ftp.ihe.net/TF_Implementation_Material/PCC/DCP/Use%20Case%20Dynamic%20Care%20Planning%20Diagram.pptx>

As identified in the IHE PCC Nursing White Paper to Advocate the Uptake of Patient Plan of Care and eNursing Summary Profiles July 2012, each clinical discipline’s plan of care or treatment plan should be incorporated into one overarching central Care Plan for the patient.

In environments where there is no centralized care plan, this profile enables care team members to share the details of their specific care plans with other providers to coordinate care. For example, a payer or provider might share a care plan they have for a patient with the provider who is caring for them, or the payer who is covering the care of the patient using this profile, without any assumption that there is a centrally managed singular care plan for the patient.

The care team concepts described in this profile are patient centered with the overarching goal to support collaborative care. Care teams have many different meanings to many different people. Each discipline has its own definition of what a care team is and what it contains. The concept of care team is also often jurisdictional and can be defined in many different ways.

Care teams can be made up of a single individual, a single group of individuals or multiple groups of individuals providing various types of services.

Care teams made up of a group or groups of individuals are often found in situations that utilize multi-disciplinary teams. The services provided by these teams can be clinical and non-clinical.

An example of a care team made up of a single individual is a patient who provides self-care and may consider his caregiver team a team of one, himself. He provides his clinical care by self-administering his medications, checking his own blood glucose levels etc. He provides his non-clinical care by taking care of his own administrative or financial needs such as scheduling his own appointments and paying for his own care services. Another example is a physical therapist who may have his own physical therapy business in which he functions independently providing physical therapy services to patients in an out-patient setting. He provides non-clinical services such as billing, appointment scheduling, etc.

Care teams can be discipline and or condition specific. Examples of discipline specific care teams include, but not limited to, cardiology care team, nursing care team, respiratory care team, etc. Conditions specific care team examples include, but not limited to, diabetes care team, oncology care team, wound care team, etc. These care teams are often clinical in nature because of the types of services provided to the patient. Some care teams can be non-clinical in nature providing services that may be administrative, personal care, social or community based. Other care teams can provide both clinical and non-clinical services.

The HL7 Learning Health System’s Patient-Centered Care Team Domain Analysis Model project[[30]](#footnote-30) has defined the following classification of types of care team: Encounter-focused Care Team, Episode-focused Care Team, Condition-focused Care Team, Care-coordination focused Care Team and Research-focused Care Team. This classification is used to include care team members specific to a particular care plan, an episode of care, an encounter or to reflect all team members across these perspectives.

A patient may be associated with multiple types of care teams at any given time. For example, a patient may be provided care by his or her PCP and/or specialist based on the encounter-focused care team paradigm. Consequently, the patient may have an inpatient stay involving episode-focused care team. During the inpatient stay, the patient care may be coordinated utilizing a care coordination-focused care team. The care provided for the patient may be for a condition that requires the need for a condition-focused care team. The patient’s situation may provide the opportunity for him or her to participate in a research-focused care team. Similarly, participants can be associated with multiple care teams at any given time as well. For example, the patient’s PCP may participate in an event-focused team and in the episode-focused team by continuing to provide care if the patient gets admitted to an inpatient setting. The PCP also participates in the condition-focused team while managing the patient’s condition. The PCP or a specialist who is involved in the patient’s care may be participating in a research-focused team in which he oversees the care of his patients participating in a research study. A care team member could fill more than one role from more than one organization on the same care team. The PCP could function in a role as part of one organization (e.g., primary care provider for the medical clinic) while at the same time function in another role as part of another organization (e.g., primary investigator on the National Institute of Health research team). Both organizations could be part of the same care team.

The point here is to reiterate that the concept of care team is often jurisdictional and can be defined in many different ways.

### X.4.2 Use Case

This profile reuses the HL7 Care Plan Domain Analysis Model specification storyboard 2: Chronic Conditions[[31]](#footnote-31) with permission from HL7 Patient Care Work Group. The storyboard includes chronic disease management as well as a transition of care episode. This profile asserts that the providers depicted in the use cases are utilizing care protocols or order sets as part of their workflow process. This is depicted by Figure X.4.2.1.1.1-1: Encounter A: Basic Process Flow for Plan Definition. The Plan and Activity definitions are used to create or update the patient care plan. This is further explained in Volume 2 of the profile. The profile will not go into detail as to the content of the care protocols or order sets.

Slight modifications have been made to the HL7 Care Plan Domain Analysis Model specification storyboard 2: Chronic Conditions storyboard in order to depict care team management needed for chronic disease management as well as transition of care episodes.

For the purpose of IHE profiling, the storyboard is being referred to as a use case.

#### X.4.2.1 Use Case: Chronic Conditions

The use case provides narrative description of clinical scenarios where the care plan is accessed, updated or used during care provision. For a process flow diagram of this entire use case, see the diagrams at: <ftp://ftp.ihe.net/TF_Implementation_Material/PCC/DCP/DynamicCarePlanningFlow_chronicCondition.vsd>

ftp://ftp.ihe.net/TF\_Implementation\_Material/PCC/DCTM/DynamicCareTeamManagement\_chronicCondition\_Flow.vsd

##### X.4.2.1.1 Chronic Conditions Use Case Description

The purpose of the HL7 chronic conditions care plan storyboard (use case) is to illustrate the creation/update, communication flow and documentation of a care plan as well as interaction of types of care teams for a patient involved in the care and treatment of a case of Type II Diabetes Mellitus with complications. The Care plan is shared between a patient, his or her primary care provider, ancillary providers and specialists involved in the care and treatment of the patient. The use case consists of four types of encounters (although in reality there could be many more encounters) which also include an episode of care in which transition of care occurs. The following encounters are depicted:

* Encounter A: Primary Care Physician Initial Visit
* Encounter(s) B: Allied Health Care Provider Visits/Specialist Visits
* Encounter(s) C: ED Visit with hospital admission (inpatient stay)
* Encounter D: Primary Care Follow-up post hospital discharge Visit

The use case contains the following actors and roles.

* Primary Care Physician: Dr. Patricia Primary
* Patient: Mr. Bob Anyman
* Diabetic Educator: Ms. Edith Teaching
* Dietitian/Nutritionist: Ms. Debbie Nutrition
* Exercise Physiologist: Mr. Ed Active
* Pharmacist: Ms. Susan Script
* Optometrist: Dr. Victor Vision
* Podiatrist: Dr. Barry Bunion
* Psychologist: Dr. Larry Listener
* Emergency Department Physician: Dr. Eddie Emergent
* Hospital Attending Physician: Dr. Allen Attend

This aspect of the Use Case is to illustrate the purpose and interaction of types of care teams for a patient involved in the care and treatment of a case of Type II Diabetes Mellitus with complications. The use case includes HL7 Care Team Definition Project’s classification of types of care teams:

Encounter-focused Care Team

* Primary Care Physician (PCP)
* Patient

Condition-focused Care Team (e.g., Diabetes)

* PCP
* Specialists
* Allied Health Care Providers
* Patient

Episode-focused Care Team

* Emergency Department (ED)
* Care Providers
* Patient
* Hospital (In-patient stay)
* Care Providers
* Discharge Planner
* Patient

Care-coordination focused Care Team

* PCP
* Home Health
* Case manager
* Care providers
* Patient
* Research-focused team
* Primary Investigator
* Sub-investigator
* Research coordinator
* Site coordinator
* Research nurse
* Patient

The use case contains the following actors and roles.

* Primary Care Physician: Dr. Patricia Primary
* Patient: Mr. Bob Anyman
* Diabetic Educator: Ms. Edith Teaching
* Dietitian/Nutritionist: Ms. Debbie Nutrition
* Physical Therapist: Mr. Ed Active
* Pharmacist: Ms. Susan Script
* Optometrist: Dr. Victor Vision
* Podiatrist: Dr. Barry Bunion
* Psychologist: Dr. Larry Listener
* Emergency Department Physician: Dr. Eddie Emergent
* Hospital Attending Physician: Dr. Allen Attend
* Discharge Planner: Debra Discharge
* Case Manager: Nurse Nancy Case
* Home Health Nurse: Nurse Angie Able
* Home Health Physical Therapist: Peter Physical
* Primary Investigator: Dr. Rick Research
* Sub-investigator: Nurse Mary Reese

###### X.4.2.1.1.1 Encounter A: Primary Care Physician Initial Visit; Encounter-focused Care Team

**Pre-conditions:** Patient Mr. Bob Anyman attends his primary care physician (PCP) clinic because he has been feeling generally unwell in the past 7-8 months. His recent blood test results reveal abnormal glucose challenge test profile.

**Description of Encounter:** Dr. Patricia Primary reviews Mr. Anyman’s medical history, presenting complaints and the oral glucose tolerance test results and concludes the patient suffers from Type II Diabetes Mellitus (Type II DM). Dr. Primary accesses Mr. Anyman’s medical record and records the clinical assessment findings and the diagnosis.

Dr. Primary discusses with Mr. Anyman the identified problems, potential risks, goals, management strategies and intended outcomes. After ensuring that these are understood by the patient, Dr. Primary begins to draw up a customized chronic condition (Type II DM) care plan based on a standardized multi-disciplinary evidenced-based Type II DM care plan adopted for use by her practice. The care plan is derived from American Diabetes Association 2017 Standards of Medical Care in Diabetes[[32]](#footnote-32). Agreed goals and scheduled activities specific for the care of Mr. Anyman are entered into the care plan.

Dr. Primary identifies Bob as a potential candidate for a nationwide Type II DM research study. She informs Bob of the study purpose and criteria for participation. Bob consents to participate in the study. Dr. Primary also makes Bob aware of her practice contact information and who to call in cases of emergency. Dr. Primary is aware that although Bob is married, he is his own primary caregiver.

Dr. Primary also discusses with the patient the importance of good nutrition and medication management and exercise in achieving good control of the disease, as well as the criticality of good skin/foot care and eye care to prevent complications. Scheduling of consultations with diabetic educator, dietitian, exercise physiologist, community pharmacist, optometrist, and podiatrist (allied health care providers) is discussed and agreed to by the patient. The frequency of visit to allied health care providers is scheduled according to the national professional recommendation for collaborative diabetes care. Dr. Primary also notices signs and symptoms of mood changes in the patient after the diagnosis is made. She recommends that the patient may benefit from seeing a clinical psychologist to which the patient also agrees.

Dr. Primary generates a set of referrals to these allied health care providers. The referrals contain information about the patient’s medical history including the recent diagnosis of Type II diabetes, reasons for referral, requested services and supporting clinical information such as any relevant clinical assessment findings including test results. A copy of the care plan agreed to by the patient is made available with the referral. The referral is sent to multiple recipients to increase the opportunity for Bob and Dr. Primary to select a preferred provider or incase the preferred provider is unable to accept the referral.

**Post Condition:** Dr. Primary draws up a customized chronic condition (Type II DM) care plan identifying the need for a condition-focused care team. Once the care plan is completed, it is committed to the patient’s medical record. The patient is offered a copy of the plan.

A number of referrals in the form of notification/request for services together with the care plan are made available to the relevant health care providers.

The patient is advised to follow the referral practice/protocol specific to the local health care system or insurance plan. For the first appointment, the patient may wait for scheduled appointments from the relevant health care providers to whom referral/request for services have been made or may be able to schedule his own appointment using booking systems of the specialist or allied health providers.

PCP EHR as

Care Plan

Contributor

Plan Definition Management System as Care Plan Definition Service

Encounter A

Search for Plan Definition

Retrieve Plan Definition

Update Plan Definition

Provide Plan Definition

Figure X.4.2.1.1.1-1: Encounter A: Basic Process Flow for Plan Definition

Encounter A

PCP EHR  
as Care Plan Contributor

Care Plan Management System as Care Plan Service

Patient Portal as Care Plan Contributor

Update Care Plan

Provide Care Plan

Retrieve Care Plan

Subscribe to Care Plan Updates

Retrieve Care Plan

Search for Care Plan

Apply Activity Definition Operation

Figure X.4.2.1.1.1-2: Encounter A: Basic Process Flow for Care Plan

PCP EHR  
as Care Team Contributor

Care Team Management System as Care Team Service

Patient Portal as Care Team Contributor

Encounter-Focused Care Team(s)

Search for Care Team

Retrieve Care Team

Update Care Team

Retrieve Care Team

Subscribe to Care Team Updates

Provide Care Team

Figure X.4.2.1.1.1-3: Basic Process Flow for Encounter-focused Care Team

###### X.4.2.1.1.2 Encounter(s) B: Allied Health Care Providers and Specialists; Condition-focused Care Team

**Pre-conditions:** Mr. Anyman’s allied health care providers and specialists have received a referral with copy of care plan from Dr. Patricia Primary.

The allied health care providers and specialists have accepted the referral and scheduled a first visit with the patient – Mr. Bob Anyman.

The case has been assigned to the following individual allied health care providers and referrals made to the applicable specialists:

1. Ms. Edith Teaching (Diabetic Educator) for development and implementation of comprehensive diabetic education program and plan to ensure that the patient understands the nature of the disease, the problem, potential complications and how best to manage the condition and prevention of potential complications.
2. Ms. Debbie Nutrition (Dietitian/Nutritionist) for development and implementation of a nutrition care plan for diabetes to ensure effective stabilization of the blood glucose level with the help of effective diet control.
3. Mr. Ed Active (Exercise Physiologist) for development and implementation of an exercise regime.
4. In certain countries (e.g., Australia), the community pharmacist (Ms. Susan Script) provides patient with education on diabetic medications prescribed for the patient by Dr. Primary, and development and implementation of an effective and safe medication management program. The objectives are to gain and maintain effective control of the condition and to prevent hypo- and hyper- glycemic episodes.
5. Dr. Larry Listener (clinical psychologist) for counseling and to develop and implement an emotional support program; this includes a plan to reduce the impact of emotional stress brought about by the newly diagnosed condition and to improve the patient’s psychological well-being. The plan may include enrolling patient in diabetic support group.
6. Dr. Victor Vision (Optometrist) for regular (e.g., 6 monthly) visual and retinal screening and to educate patient on the eye care and how best to prevent/minimize the risks of ocular complications.
7. Dr. Barry Bunion (Podiatrist) for education on the risks of foot complications and to develop and implement an effective foot care program including regular self-assessment, care of the feet and follow-up visits.

**Description of Encounter:** The patient is registered at the allied health care provider/specialist’s reception. Any additional or new information provided by the patient is recorded in the health care record system operated by the allied health provider clinic.

During the first consultation, the allied health care provider/specialist reviews the referral and care plan provided by Dr. Primary. *The creation/update of the care plan is based on order sets, care guides, protocols, etc.*

During subsequent consultation, the allied health care provider/specialist reviews the patient’s health care record and most recent care plan of the patient.

At each consultation, the allied health care provider reviews the patient’s health record, assesses the patient, checks the progress and any risks of non-adherence (compliance) and complications, and discusses the outcomes of the management strategies and/or risks. Any difficulties in following the management strategies or activities by the patient are discussed. Any new/revised goals and timing, new intervention and self-care activities are discussed and agreed to by the patient. The new/changed activities are scheduled and target dates agreed upon.

The allied health care provider updates the clinical notes and the care plan with the assessment details, and any changes to the management plan including new advice to the patient. The date of next visit is also determined. Each care provider makes Bob aware of their practice contact information and who to call in cases of emergency. Each care provider is aware that although Bob is married, he is his own primary caregiver

Table X.4.2.1.1.2-1: Allied Health Professionals/Specialists Encounters – Activities and Outcomes

| Provider / Allied Health Provider | Encounter Activities | Outcomes | Communications |
| --- | --- | --- | --- |
| Diabetic Educator | Review referral/patient progress  assess learning needs and strategy  discuss and finalize education plan | Develop/update education plan  Update clinical notes  Generate progress notes | New/updated education plan to patient  Summary care plan and progress note shared with primary care provider and other care providers, |
| Dietitian/Nutritionist | Review referral/patient progress  Assess diet management needs and strategies  Discuss and finalize diet management plan | Develop/update diet plan  Weight assessment; Exercise plan  Diet management plan;  Referral to educator and exercise therapy if necessary  Update clinical notes  Generate progress notes | New/updated care plan to patient  Summary care plan and progress note shared with primary care provider and other care providers, e.g., diabetic educator, exercise physiologist, etc. |
| Exercise Physiologist | Review referral/patient progress  Assess exercise/activity needs and strategies  Discuss and finalize exercise plan | Develop/update exercise plan:  Weight assessment; exercise plan  Update clinical notes  Generate progress notes | New/updated exercise plan to patient  Summary care plan and progress note shared with primary care provider and other care providers, e.g., diabetic educator, dietitian, etc. |
| Community Pharmacist | Review patient medication profile  Assess medication management (education, conformance, etc.) needs and strategies  Discuss and finalize medication management plan | Develop/update medication management plan:  patient current medication list assessment result;  recommendation on meds management; referral to other provider(s) if necessary  dispense record on dispensed meds  Update clinical notes  Generate progress notes | New/updated medication management plan to patient  Summary care plan and progress note shared with primary care provider and to other care providers, e.g., diabetic educator, dietitian, etc. |
| Clinical Psychologist | Review referral/patient progress  Assess emotional status, coping mechanisms and strategies  Discuss and finalize psychological management plan | Develop/update psychological management plan:  Emotion assessment;  Psychotherapy session plan  Update clinical notes  Generate progress notes | New/updated psychological management plan to patient  Summary care plan and progress note shared with primary care provider and other care providers, e.g., diabetic educator, dietitian, etc. |
| Optometrist | Review referral/patient progress  Assess eye care needs and strategies  Discuss and finalize eye care plan | Develop/update eye care plan:  Regular eye checks for early detection of Diabetic retinopathy (1yearly to 2 yearly depending on national protocol and how advanced is DM)  Stop smoking (prevent smoking related damage to eye cells)  Wear sun glasses when in sun (prevent UV accelerating eye damage) – dispense prescription sun glasses if necessary;  Referral to Dietitian/Nutritionist for counseling on diet rich in fruits and green leafy veg and Omega 3 fats along with effective weight control  Update clinical notes  Generate progress notes | New/updated eye care plan to patient  Summary care plan and progress note shared with primary care provider and other care providers, e.g., diabetic educator, dietitian, etc. |
| Podiatrist | Review referral/patient progress  Assess foot care needs and strategies  Discuss and finalize foot care plan | Develop/update foot care plan  Foot assessment  Foot care plan  Update clinical notes  Generate progress notes | New/updated foot care plan to patient  Summary care plan and progress note shared with primary care provider and other care providers, e.g., diabetic educator, dietitian, pharmacist, etc. |

**Post Condition:** An updated allied health domain specific care plan complete with action items and target dates is completed with patient agreement.

The patient is provided a copy of the new/updated care plan at the end of each allied health/specialist consultation.

Updates to the care plan are supported by workflow, where for example at the end of each consultation a progress note is written by the allied health provider/specialist which documents the outcomes of the assessment, any new risks identified and changes to or new management strategies that have been included in the updated care plan. This allied health domain specific progress note is shared with the patient’s primary care provider, Dr. Primary. Any care coordination responsibilities required of Dr. Primary is also communicated.

The progress note may also be shared with any other allied health care provider(s) who may need to be informed about changes in risks, goals, and management plan that are relevant to the ongoing management of the patient. For example, a progress note from a dietitian/nutritionist may contain clinical information that may need to be considered by the diabetic educator.

Providers EHRs (e.g., specialists and Allied Care Providers) as Care Plan Contributor

Plan Definition Management System as Care Plan Definition Service

Encounter(s) B

Retrieve Plan Definition

Subscribe to Plan Definition Updates

Provide Plan Definition

Update Plan Definition

Figure X.4.2.1.1.2-1: Encounter(s) B: Basic Process Flow for Plan Definition

Encounter(s) B

Providers EHRs (e.g., specialists and Allied Care Providers) as Care Plan Contributor

Care Plan Management System as Care Plan Service

Patient Portal as Care Plan Contributor

Update Care Plan

Provide Care Plan

Retrieve Care Plan

Subscribe to Care Plan Updates

Subscribe to Care Plan Updates

Retrieve Care Plan

Apply Activity Definition Operation

Figure X.4.2.1.1.2-2: Encounter(s) B: Basic Process Flow for Care Plan

Providers EHRs (e.g., PCP, specialists and Allied Care Providers) as Care Team Contributor

Care Team Management System as Care Team Service

Patient Portal as Care Team Contributor

Retrieve Care Team

Transaction-B [B]

Subscribe to Care Team Updates

Transaction-B [B]

Subscribe to Care Team Updates

Transaction-B [B]

Retrieve Care Team

Transaction-B [B]

Condition-Focused Care Team(s)

Transaction\_1 [1]

Update Care Team

Transaction-B [B]

Provide Care Team

Transaction-B [B]

Figure X.4.2.1.1.2-3: Basic Process Flow for Condition-focused Care Team

###### X.4.2.1.1.3 Encounter(s) C: ED Visit and Hospital Admission; Episode-focused Care Team

**Note**: "Episode" in acute care and chronic disease management usually encompasses more than one encounter event. In this use case, it includes the ED encounter and subsequent in-patient encounter

**Pre-Condition:** Mr. Bob Anyman took a 3-month holiday in Australia during the southern hemisphere spring season, missed the influenza immunization window in his northern hemisphere home country, and forgot about the immunization after he returned home. He develops a severe episode of influenza with broncho-pneumonia and very high blood glucose level (spot BSL = 23 mM) as complications. He suffers from increasing shortness of breath on a Saturday afternoon.

Mr. Anyman presents himself at the emergency department of his local hospital as Dr. Primary’s clinic is closed over the weekend.

**Description of Encounter:** Mr. Anyman is admitted to the hospital and placed under the care of physicians from the general medicine clinical unit.

During the hospitalization, the patient is given a course of IV antibiotics and insulin injections to stabilize the blood glucose level. The patient was assessed by the hospital attending physician, Dr. Allen Attend, as medically fit for discharge after four days of inpatient care. Dr. Attend reconciles the medication treatment during inpatient care, creates a discharge medication list, outlines follow up information and discusses post discharge care with the patient. He recommends the patient to consider receiving influenza immunization before the next influenza session and updates this as recommendation to Dr. Primary in the patient’s discharge plan.

Planning for discharge is initiated by the physician and the nurse assigned to care for the patient soon after admission as per hospital discharge planning protocol. Discharge planning is done by the **in-patient** **case management team** in collaboration with Bob’s care providers. The case management team also provides non-clinical services such as utilization review to ensure that provided health services is appropriate for billing purposes. All case management activities are documented in the hospital health care record system.

The discharge plan is finalized on the day of discharge and a discharge summary is generated.

**Post Condition:** The patient’s discharge care plan is completed. This plan may include information on changes to medications, management recommendations to the patient’s primary care provider and the patient, and any health care services that are requested or scheduled.

The patient is given a copy of the discharge summary that includes the discharge care plan.

A discharge summary and the discharge care plan are shared with the patient’s primary care provider, Dr. Primary with recommendation for pre-influenza season immunization.

Note: The process flow pattern for this encounter is the same as encounter(s) B. See Figures X.4.2.1.1.2-1, X.4.2.1.1.2-2 and X.4.2.1.1.2-3

###### X.4.2.1.1.4 Encounter D: Primary Care Follow-up Visits; Care Coordination Focused Care Team

Pre-Condition: Patient Mr. Bob Anyman is scheduled for a post-hospital discharge consultation with his primary care provider, Dr. Primary.

Mr. Anyman is seen by Dr. Primary at her clinic on the day of appointment.

The discharge summary information from the hospital is incorporated into the patient’s medical record and is ready for Dr. Primary to review at the consultation.

**Description of Encounter:** Primary Care Physician Dr. Patricia Primary reviews patient Mr. Anyman’s hospital discharge summary and discusses the pre-influenza season immunization recommendation with the patient. The patient agrees with the recommendation. The care plan is updated.

Dr. Primary notices that the patient has gained extra weight and the blood sugar level has not quite stabilized after discharge from hospital. Dr. Primary reviews the care plan and discusses with patient the plan to change the diet and medication. Patient agrees. The care plan is updated.

Dr. Primary issues a new prescription to the patient and asks the patient to make an early appointment to see the dietitian to discuss new nutrition management strategy and plan.

Dr. Primary generates progress notes with nutrition management and exercise change recommendations are generated by Dr. Primary and shared with the patient’s dietitian. The care plan is updated and shared with relevant allied health providers.

Dr. Primary changes patient’s follow-up visits from four monthly to two monthly for the next two appointments with the aim to review the follow-up frequency after that.

**Post Condition:** A new prescription is shared with the patient’s community pharmacy. Ms. Script will discuss the new medication management plan with the patient when he goes to pick up his medications.

The patient also makes an early appointment to see the dietitian and exercise physiologist. A copy of progress notes from Dr. Primary will be made available to the dietitian and exercise physiologist before the scheduled appointment.

Patient gets a copy of the updated care plan, and a copy of the plan is also shared with relevant allied health providers.

Note: The process flow pattern for this encounter is the same as encounter A. See Figures X.4.2.1.1.1-1 and X.4.2.1.1.1-2.

###### X.4.2.1.1.5 Diabetes Research Participation; Research Focused Care Team

**Pre-Condition:** Bob has consented to participate in a diabetes research trial relating to medication adherence. Bob is accepted in the study and is enrolled

**Description of Care:** The purpose of the research study is to measure Bob’s adherence to his diabetes care. Dr. Rick Researcher is the primary investigator of the research study. His team gathers and evaluates data on the diabetes care Bob receives and the type of care providers providing Bob’s diabetes care.Bob is seen by a nurse who is a sub-investigator for the study in Bob’s city. The nurse conducts an enrollment interview and administers a survey questionnaire about Bob’s knowledge of his DM and his self-management. She also obtains Bob’s consent to access his records related to his care in the other facilities where he is seen. He will return every 6 months for a follow-up visit with the study nurse for a period of 3 years.

**Post Condition:** Any updates or changes to Bob’s care and the various care teams are shared.

Note: The process flow pattern for this care coordination care team is the same as condition-focused care team. See Figure X.4.2.1.1.2-3.

#### X.4.2.2 Use Case: Pregnancy Plan

This use case provides narrative description of clinical scenarios that can lead to the definition of a standard procedure for the treatment of pregnant women. The definition covers the period from the time of diagnosis through postpartum.

The following section describes a normal pregnancy use case.

##### X.4.2.2.1 Normal Pregnancy Use Case Description

In this use case the patient actively participates in her care planning in order to ensure a normal and healthy pregnancy. The entire process involves collaborative care which includes the patient and all her care providers. This entails sharing of care plan information across care providers and with the patient.

The following macro steps are depicted:

* Step A: Diagnosis and first General Practitioner encounters
* Step B: Subsequent encounters with include medical examinations and laboratory studies performed during the pregnancy period
* Step C: Delivery and Postpartum care

The use case involves the following actors and roles:

* Patient: Mrs. Kate Anywoman
* General Practitioner: Dr. Max Power
* Obstetrician-Gynecologist: Dr. John Smith
* Healthcare Professionals needed for laboratory studies

###### X.4.2.2.1.1 Step A: Diagnosis and First General Practitioner encounter

**Pre-conditions:** Patient, Mrs. Kate Anywoman, in the recent weeks shows signs of nausea, breast changes, fatigue and her menstrual cycle is late. Due to these symptoms, she decides to perform a home pregnancy test. The result of the test is positive.

**Description of Encounter:** Mrs. Kate Anywoman visits her General Practitioner, Dr. Max Power, informing him about the test result. Dr. Power creates or updates Mrs. Anywoman’s care plan based on evidenced based clinical practice guideline and identifies the need for a condition-focused care team. Dr. Power orders a quantitative human chorionic gonadotropin (HCG) blood test as an intervention. The care plan is updated and the added information is made available to be shared with the laboratory performing the study and with the patient.

**Patient Portal**

**OB/GYN as**

**Care Plan Contributor**

Perform Encounter

**Care Plan Definition Service**

Search for Care Plan (pregnancy)

Search for PlanDefinition

Provide ActivityDefinition

Plan

Update Care Plan (pregnancy)

Care Plan

Request Services

Share Response

Provide services

Update Care Plan

**Referral Providers as Care Plan Contributor**

Referral Request

Care Plan

Referral Response

Retrieve Care Plan

**Care Plan Service**

Retrieve Care Plan

Retrieve Care Plan

Update Care Plan

Retrieve Care Plan (pregnancy)

**Lab/Pharmacy/Radiology as Care Plan Contributor**

Provide applicable services

Apply Activity Definition Operation

Care Plan

Search for PlanDefinition

Provide ActivityDefinition

Plan

Apply Activity Definition Operation

Apply Activity Definition Operation

Care Plan

Search for PlanDefinition

Provide ActivityDefinition

Apply Activity Definition Operation

Update Care Plan

Mrs. Anywoman goes to the lab for the HCG blood test. It is confirmed that she is pregnant. The lab result is made available to be shared.

Mrs. Anywoman follows up with Dr. Max Power to discuss her pregnancy case. Dr. Power confirms that this is not a high-risk pregnancy case and instructs her or refers her to be followed by an obstetrician-gynecologist (OB-GYN). He updates the patient’s care plan with the pregnancy information and generates applicable planned interventions/orders based on best practice. The care plan is now updated with information from the patient’s initial encounter with Dr. Power which includes the HCG lab result and other related observations performed during these encounters. Observations include physical exams, vital signs, referrals and applicable laboratory tests and results. The care plan also includes patient instructions which lists things Mrs. Anywoman should and should not do to ensure a healthy pregnancy. The updated care plan is made available to be shared.

**Post condition:** Dr. Max Power updates the care plan and makes it available to be shared with Mrs. Anywoman and her healthcare providers. Mrs. Anywoman is able access to her care plan so she can actively participate in her care. Other healthcare providers involved in Mrs. Anywoman care are made aware of the updated care plan and it’s available to be accessed.

Note: The process flow pattern for this care encounter is the same as encounter-focused care team. See Figure X.4.2.1.1.1-3.

**Patient Portal**

Positive pregnancy test

**General Practitioner as**

**Care Plan Contributor**

Encounter #1

**Care Plan Definition Service**

**Lab as Care Plan Contributor**

Search for Care Plan (pregnancy)

Search for PlanDefinition

Provide ActivityDefinition

Plan

Create Care Plan (pregnancy)

Care Plan

Share Lab Request

Care Plan

Share Lab Result

Care Plan

Perform Lab test

Update Care Plan

**OB/GYN as Care Plan Contributor**

Share Referral Request

Care Plan

Store Care Plan

Retrieve Care Plan

**Care Plan Service**

Retrieve Care Plan

Retrieve Care Plan

Update Care Plan

Perform

Consultation

Share Consultation Report

Care Plan

Update Care Plan

Retrieve Care Plan

Apply Activity Definition Operation

Care Plan

Figure X.4.2.2.1.1-1: Step A: Diagnosis and First General Practitioner Encounter

###### X.4.2.2.1.2 Step B: Medical observations and treatment during pregnancy

**Pre-conditions:** Mrs. Kate Anywoman is made aware of her updated care plan which she is able to access. Healthcare providers participating in Mrs. Anywoman’s care is also made aware of her updated care plan which is made available to be accessed.

**Description of Encounter:** After Mrs. Kate Anywoman encounters with her general practitioner, Dr. Max Power, she continues her pregnancy care with her obstetrician-gynecologist (OB-GYN) Dr. John Smith. Dr. Smith provides Mrs. Anywoman routine pregnancy care based on evidence based practice using clinical practice guidelines. Mrs. Anywoman’s care includes a number of observations and treatment that may be repeated at varying times throughout her pregnancy period. This is needed in order to discover and treat possible complications, such as toxoplasmosis, that can occur during pregnancy. As Mrs. Anywoman’s care plan is updated, it is made available for access by her and healthcare providers involved in her care.

**Post condition:** Mrs. Kate Anywoman was able to receive evidenced based pregnancy care throughout her pregnancy. She and her healthcare providers were able to actively participate in her care while utilizing her care plan to keep track of near or real-time updates throughout her pregnancy period.

Note: The process flow pattern for these care encounters are the same as condition-focused care team. See Figure X.4.2.1.1.2-3.

Figure X.4.2.2.1.2-1: Step B: Medical observations and treatment during pregnancy

###### X.4.2.2.1.3 Step C: Delivery and Postpartum treatment

**Pre-conditions**: Mrs. Kate Anywoman’s childbirth at a birthing facility was successful. She was discharged to home after a duration of forty-eight hours at the birthing facility. Discharge planning was done by the **in-patient** **case management team** in collaboration with Kate’s care providers.

**Description of Encounter**: Six weeks after her baby was born, Mrs. Anywoman has a post-partum encounter with Dr. John Smith, her OB-GYN. Routine observations such as her glucose level and vital signs are within normal limits. Her care plan is updated and made available.

**Post condition**: Mrs. Anywoman’s postpartum period is ended. In the future, Mrs. Anywoman’s care plan will be updated with any future conditions, observations and treatments and it will be made available for access by her and healthcare providers involved in her care.

Note: The process flow pattern for these encounters are the same as the episode-focused care team and the care coordination-focused care team. See Figure X.4.2.1.1.2-3.

**Patient Portal**

**Birthing Facility as**

**Care Plan Contributor**

Perform Encounter

**Care Plan Definition Service**

Search for Care Plan (pregnancy)

Search for PlanDefinition

Provide ActivityDefinition

Plan

Update Care Plan (pregnancy)

Care Plan

Request Services

Share Response

Provide services

Update Care Plan

**OB/GYN as Care Plan Contributor**

Share Discharge Plan

Care Plan

Retrieve Care Plan

Retrieve Care Plan

Retrieve Care Plan

Update Care Plan

Retrieve Care Plan (pregnancy)

**Lab/Pharmacy/Radiology as Care Plan Contributor**

Provide applicable services

Apply Activity Definition Operation

Provide ActivityDefinition

Plan

Apply Activity Definition Operation

Care Plan

Apply Activity Definition Operation

Search for PlanDefinition

Provide ActivityDefinition

Plan

Apply Activity Definition Operation

Care Plan

Update Care Plan

Care Plan

Search for PlanDefinition

**Care Plan Service**

Figure X.4.2.2.1.3-1: Step C: Delivery Care

**Patient Portal**

**OB/GYN as**

**Care Plan Contributor**

Post-Partum Encounter

**Care Plan Definition Service**

Search for Care Plan (post-partum)

Search for PlanDefinition

Provide ActivityDefinition

Update Care Plan (pregnancy)

Request Services

Share Response

Provide services

Update Care Plan

Retrieve Care Plan

**Care Plan Service**

Retrieve Care Plan

Retrieve Care Plan (post-partum)

**Lab/Pharmacy/Radiology as Care Plan Contributor**

Apply Activity Definition Operation

Provide ActivityDPlan

Apply Activity Definition Operation

Search for PlanDefinition

Figure X.4.2.2.1.3-2 Step C: Post-Partum Care

## X.5 DCP Security Considerations

See [ITI TF-2.x: Appendix Z.8](http://ihe.net/uploadedFiles/Documents/ITI/IHE_ITI_Suppl_Appx-Z.pdf) “Mobile Security Considerations”

## X.6 DCP Cross Profile Considerations

### X.6.1 Reconciliation of Clinical Content and Care Providers (RECON) Profile

A Reconciliation Agent might be grouped with a Care Plan Contributor and with a Care Plan Definition Service to facilitate the planning reconciliation processes. It can also be grouped with a Care Team Contributor to facilitate reconciliation of Care Team members.

### X.6.2 Alert Communication Management Profile

An Alert Communicator, upon receiving an alert from an Alert Manager, can send the alert to a care planning device (client application) notifying the endpoint device that a change in the patients’ plan may be warranted.

### X.6.2 ATNA Profile

As mentioned in the security considerations section, a Secure Node or a Secure Application Actor in the ATNA Profile may be grouped with any and all of the actors in this profile.

Volume 2 – Transactions

Add Section 3.37

## 3.37 Update Care Plan [PCC-37]

### 3.37.1 Scope

This transaction is used to update or to create a care plan. A CarePlan resource is submitted to a Care Plan Service where the update or creation is handled.

### 3.37.2 Actor Roles

Care Plan Contributor

Care Plan Service

Figure 3.37.2-1: Use Case Diagram

Table 3.37.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor submits a care plan that is updated or needs to be created. |
| **Actor:** | Care Plan Service |
| **Role:** | The Care Plan Service receives submitted care plans for management as per FHIR Resource Integrity management. |

### 3.37.3 Referenced Standards

HL7 FHIR standard STU 3

### 3.37.4 Interaction Diagram

Care Plan Contributor

Update Care Plan

Care Plan Service

Create Care Plan

#### 3.37.4.1 Update Care Plan

The Care Plan Contributor submits a care plan that has been edited to a Care Plan Service. The Care Plan Service handles the FHIR CarePlan Resource according to FHIR Resource integrity.

##### 3.37.4.1.1 Trigger Events

An existing care plan has been edited, and the set of activity for the care plan are to be committed to a Care Plan Service.

##### 3.37.4.1.2 Message Semantics

This is an HTTP or HTTPS PUT of a CarePlan resource, as constrained by this profile.

The base URL for this is: [base]/CarePlan/[id]

Where the body of the transaction contains the CarePlan resource.

See: http://hl7.org/fhir/STU3/http.html#update

##### 3.37.4.1.3 Expected Actions

When updating an existing care plan, the Care Plan Contributor shall merge changes into a recently received CarePlan, leaving unchanged content unaltered.

If the Care Plan Service returns an error to the Update Care Plan transaction, as would happen if the version of the CarePlan is old, then the Care Plan Contributor should perform the steps of Retrieve Care Plan, merge changes, and then attempt Update Care Plan again. For example, two providers retrieved copies of a care plan, one after another, and then attempt to update the care plan later.

Since the Care Plan Service SHALL support versioning of the CarePlan resources, the response SHALL contain meta.versionId. See http://hl7.org/fhir/http.html#create details on the response from the Care Plan Service.

#### 3.37.4.2 Create Care Plan

The Care Plan Contributor submits a newly created care plan to a Care Plan Service.

##### 3.37.4.2.1 Trigger Events

Newly created care plan content is ready to be saved to a Care Plan Service.

##### 3.37.4.2.2 Message Semantics

This is an HTTP or HTTPS POST of a CarePlan resource, as constrained by this profile.

The base URL for this is: [base]/CarePlan

Where the body of the transaction contains the CarePlan resource.

See http://hl7.org/fhir/STU3/http.html#create.

##### 3.37.4.2.3 Expected Actions

The Care Plan Service responds, with success or error, as defined by the FHIR RESTful create interaction. See http://hl7.org/fhir/STU3/http.html#create.

### 3.37.5 Security Considerations

See Section X.5 DCP Security Considerations

## 3.38 Retrieve Care Plan [PCC-38]

### 3.38.1 Scope

This transaction is used to retrieve a specific care plan using a known FHIR CarePlan resource id.

### 3.38.2 Actor Roles

Care Plan Contributor

Care Plan Service

Figure 3.38.2-1: Use Case Diagram

Table 3.38.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor requests a specific care plan using the CarePlan id |
| **Actor:** | Care Plan Service |
| **Role:** | The Care Plan Service returns the requested CarePlan resource, or an error if the requested id does not exist. |

### 3.38.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.38.4 Interaction Diagram

Care Plan Contributor

Retrieve Care Plan

Care Plan Service

#### 3.38.4.1 Retrieve Care Plan

The Care Plan Contributor retrieves a specific care plan from the Care Plan Service.

##### 3.38.4.1.1 Trigger Events

Any time a specific care plan needs to be retrieved, for the purposes of viewing or in conjunction with the preparation for an update to a care plan.

##### 3.38.4.1.2 Message Semantics

The message is a FHIR HTTP or HTTPS GET of a CarePlan resources where the parameter provided is the CarePlan.id with an option to ask for a specific version of the given CarePlan

The URL for this operation is: [base]/CarePlan/[id]

or, if this is an historical, version specific retrieval: [base]/CarePlan/[id]/\_history/[vid]

##### 3.38.4.1.3 Expected Actions

The Care Plan Contributor initiates the retrieve request using HTTP or HTTPS GET, and the Care Plan Service responds according to the FHIR GET specification with the requested care plan or an error message. See http://hl7.org/fhir/STU3/http.html#read.

### 3.38.5 Security Considerations

See Section X.5 DCP Security Considerations.

## 3.39 Subscribe to Care Plan Updates [PCC-39]

### 3.39.1 Scope

This transaction is used to subscribe to updates made to a Care Plan.

Note: There is no transaction to unsubscribe from care plan updates. However, to unsubscribe from care plan updates, the Care Plan contributor SHALL support RESTful delete of the subscription resource. See <http://hl7.org/fhir/STU3/http.html#delete> .

### 3.39.2 Actor Roles

Care Plan Contributor

Care Plan Service

Figure 3.39.2-1: Use Case Diagram

Table 3.39.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor subscribes to updates based upon changes to a CarePlan resource. |
| **Actor:** | Care Plan Service |
| **Role:** | The Care Plan Service evaluates the involved resources of the Subscription and uses the defined channel to notify a Care Plan Contributor about changes. |

### 3.39.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.39.4 Interaction Diagram

Care Plan Contributor

Subscribe to Care Plan Updates

Care Plan Service

#### 3.39.4.1 Subscribe to Care Plan Updates

A Care Plan Contributor may choose to receive updates as CarePlan resources are changed by using the Subscribe to Care Plan Updates transaction.

When the criteria of a subscription request are satisfied, the Care Plan Service sends the entire Care Plan resource, using the Provide Care Plan [PCC-40] transaction to the subscribing Care Plan Contributor.

##### 3.39.4.1.1 Trigger Events

Subscribing to Care Plan Updates is a business and workflow decision, and the use of this is optional in the DCP Profile.

The Subscription criteria, used to trigger updates, may be simple or complex.

Simple Subscription criteria includes only query parameters about a CarePlan resource, such as the id. Simple Subscription criteria results in notifications of changes to the CarePlan resource itself, but the subscription update would not be triggered by changes to a resource referenced by the care plan.

Complex Subscription criteria contains chained parameters, such as parameters about resources that are referenced within the CarePlan. For example, chaining parameters about a goal referenced from a CarePlan results in notifications of changes to either the CarePlan or to the referenced goal.

##### 3.39.4.1.2 Message Semantics

This is an HTTP or HTTPS POST of a Subscription resource, as constrained by this profile.

The base URL for this is: [base]/Subscription

Where the body of the transaction contains the Subscription resource.

See http://hl7.org/fhir/STU3/subscription.html.

##### 3.39.4.1.3 Expected Actions

The Care Plan Contributor shall check the response from the Care Plan Service. See http://hl7.org/fhir/STU3/http.html#create for details.

The Care Plan Service shall check that the Subscription resource meets the constraints defined by this profile, in PCC TF-3: 6.6.2.

When a Subscription resource is accepted, the Care Plan Service sets the status to “requested” and returns in the Location header the Subscription’s logical id for use in future operations. This logical id shall be saved by the Care Plan Contributor.

A Subscription may be rejected by the Care Plan Service for a number of reasons, such as if the Subscription is incomplete or does not meet the requirements of this profile as in PCC TF-3: 6.6.2

As per FHIR POST protocol, a rejected transaction results in the return of a 406 – rejected HTTP response.

#### 3.39.4.2 Update Subscription to Care Plan Updates

An existing subscription may be updated by a Care Plan Contributor, for example to refine the search criteria.

##### 3.39.4.2.1 Trigger Events

An existing subscription needs to be updated.

##### 3.39.4.2.2 Message Semantics

This is an HTTP or HTTPS PUT of a Subscription resource, as constrained by this profile.

The base URL for this is: [base]/Subscription/[id]

Where the body of the transaction contains the Subscription resource.

See http://hl7.org/fhir/STU3/http.html#update.

##### 3.39.4.2.3 Expected Actions

See http://hl7.org/fhir/STU3/http.html#update

### 3.39.5 Security Considerations

See X.5 DCP Security Considerations

## 3.40 Provide Care Plan [PCC-40]

### 3.40.1 Scope

This transaction is used to provide an updated CarePlan resource to a Care Plan Contributor that has subscribed to updates.

### 3.40.2 Actor Roles

Care Plan Service

Care Plan Contributor

Figure 3.40.2-1: Use Case Diagram

Table 3.40.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Service |
| **Role:** | The Care Plan Service provides updated CarePlan resources to subscribed Care Plan Contributors. |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor that has subscribed to care plan updates receives updates of changed CarePlan resources. |

### 3.40.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.40.4 Interaction Diagram

Care Plan Service

Provide Care Plan

Care Plan Contributor

#### 3.40.4.1 Provide Care Plan

The Care Plan Service sends a CarePlan resource to the endpoint specified in the Subscription resource.

##### 3.40.4.1.1 Trigger Events

A change to a resource causes a Subscription Criteria to evaluate as true, so the Care Plan Service sends the updated CarePlan resource to the designated endpoint.

##### 3.40.4.1.2 Message Semantics

This is an HTTP or HTTPS POST of a CarePlan resource, as constrained by this profile.

The base URL for this is specified in the registered Subscription resource.

Where the body of the transaction contains the CarePlan resource.

See <http://hl7.org/fhir/STU3/subscription.html>

##### 3.40.4.1.3 Expected Actions

The Care Plan Contributor receives the CarePlan resource in the body of the POST.

### 3.40.5 Security Considerations

See X.5 DCP Security Considerations

## 3.41 Search for Care Plan [PCC-41]

### 3.41.1 Scope

This transaction is used to find a care plan. The Care Plan Contributor searches for a care plan of interest. A care plan located by search may then be retrieved for viewing or updating.

### 3.41.2 Actor Roles

Care Plan Contributor

Care Plan Service

Figure 3.41.2-1: Use Case Diagram

Table 3.41.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor initiates Search for Care Plan in order to locate a care plan of interest. |
| **Actor:** | Care Plan Service |
| **Role:** | The Care Plan Service responds to the Search for Care Plan according to the search parameters and values provided in the transaction. |

### 3.41.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.41.4 Interaction Diagram

Care Plan Contributor

Search for Care Plan

Care Plan Service

#### 3.41.4.1 Search for Care Plan

The Search for Care Plan is implemented through the FHIR search operation using the REST platform constrained to the HTTP or HTTPS GET.

##### 3.41.4.1.1 Trigger Events

The Search for Care Plan may be initiated for a number of different reasons:

1. need to view a care plan
2. need to update a portion of a care plan
3. need to subscribe to updates for a care plan

##### 3.41.4.1.2 Message Semantics

This is a standard FHIR search operation on the CarePlan resource. It SHALL use the HTTP or HTTPS GET protocol

The URL for this operation is: [base]/CarePlan/\_search

See the FHIR CarePlan resource Search Parameters at <http://hl7.org/fhir/STU3/careplan.html#search>

##### 3.41.4.1.3 Expected Actions

The Care Plan Contributor initiates the search using HTTP or HTTPS GET, and the Care Plan Service responds according to the [FHIR Search specification](http://hl7.org/fhir/STU3/search.html) with zero or more care plans that match the search parameter values supplied with the search message. Specifically, the Care Plan Service returns a [bundle](http://hl7.org/fhir/STU3/bundle.html) as the HTTP Response, where the bundle includes the resources that are the results of the search.

### 3.41.5 Security Considerations

See X.5 DCP Security Considerations.

## 3.63 Update Plan Definition [PCC-63]

### 3.63.1 Scope

This transaction is used to update or to create a plan definition. A PlanDefinition resource is submitted to a Care Plan Definition Service where the update or creation is handled.

### 3.63.2 Actor Roles

Care Plan Contributor

Care Plan Definition Service

Figure 3.63.2-1: Use Case Diagram

Table 3.63.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor submits a plan definition that is updated or needs to be created. |
| **Actor:** | Care Plan Definition Service |
| **Role:** | The Care Plan Definition Service receives submitted plan definitions for management as per FHIR Resource Integrity management. |

### 3.63.3 Referenced Standards

HL7 FHIR standard STU 3

### 3.63.4 Interaction Diagram

Care Plan Contributor

Update Plan Definition

Care Plan Definition Service

Create Plan Definition

#### 3.63.4.1 Update Plan Definition

The Care Plan Contributor submits a plan definition that has been edited to a Care Plan Definition Service. The Care Plan Definition Service handles the FHIR PlanDefinition Resource according to FHIR Resource integrity.

##### 3.63.4.1.1 Trigger Events

An existing plan definition has been edited, and the set of activity for the plan definition are to be committed to a Care Plan Definition Service.

##### 3.63.4.1.2 Message Semantics

This is an HTTP or HTTPS PUT of a PlanDefinition resource, as constrained by this profile.

The base URL for this in FHIR STU 3 is: [base]/PlanDefinition/[id]

Where the body of the transaction contains the PlanDefinition resource.

See: <http://hl7.org/fhir/STU3/http.html#update>

This $apply operation assumes the PlanDefinition and ActivityDefinition resources are already present on the server.

However, DCP workflow supports the ability to pass the PlanDefinition resource to the FHIR server. To that end, the Care Plan Contributor retrieves the PlanDefinition from the Care Plan Definition service as a template but then allows the user to edit it by selecting the ActivityDefinitions to include before passing the edited PlanDefinition to the server in the $apply operation.

FHIR [gForge 17395](https://gforge.hl7.org/gf/project/fhir/tracker/?action=TrackerItemEdit&tracker_item_id=17395) and [gForge 17437](https://gforge.hl7.org/gf/project/fhir/tracker/?action=TrackerItemEdit&tracker_item_id=17437) has been approved by HL7 FHIR to add a type level operation with the PlanDefinition/ActivityDefinition as a parameter. (Please see <http://build.fhir.org/plandefinition-operation-apply.html> and <http://build.fhir.org/activitydefinition-operation-apply.html> )

The base URL for this will be: [base]/PlanDefinition

##### 3.63.4.1.3 Expected Actions

When updating an existing plan definition, the Care Plan Contributor shall merge changes into a recently received PlanDefinition, leaving unchanged content unaltered.

If the Care Plan Definition Service returns an error to the Update Plan Definition transaction, as would happen if the version of the PlanDefinition is old, then the Care Plan Contributor should perform the steps of Retrieve Plan Definition, merge changes, and then attempt Update Plan Definition again. For example, two providers retrieved copies of a plan definition, one after another, and then attempt to update the plan definition later.

Since the Care Plan Definition Service SHALL support versioning of the PlanDefinition resources, the response SHALL contain meta.versionId. See <http://hl7.org/fhir/STU3/http.html#create> details on the response from the Care Plan Definition Service.

#### 3.63.4.2 Create Plan Definition

The Care Plan Contributor submits a newly created plan definition to a Care Plan Definition Service.

##### 3.63.4.2.1 Trigger Events

Newly created plan definition content is ready to be saved to a Care Plan Definition Service.

##### 3.63.4.2.2 Message Semantics

This is an HTTP or HTTPS POST of a PlanDefinition resource, as constrained by this profile.

The base URL for this is: [base]/PlanDefinition

Where the body of the transaction contains the PlanDefinition resource.

See <http://hl7.org/fhir/STU3/http.html#create>

##### 3.63.4.2.3 Expected Actions

The Care Plan Definition Service responds, with success or error, as defined by the FHIR RESTful create interaction. See <http://hl7.org/fhir/STU3/http.html#create>

### 3.63.5 Security Considerations

See Section X.5 DCP Security Considerations

## 3.64 Retrieve Plan Definition [PCC-64]

### 3.64.1 Scope

This transaction is used to retrieve a specific Plan Definition using a known FHIR PlanDefinition resource id.

### 3.64.2 Actor Roles

Care Plan Contributor

Care Plan Definition Service

Figure 3.64.2-1: Use Case Diagram

Table 3.64.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor requests a specific plan definition using the PlanDefinition id. |
| **Actor:** | Care Plan Definition Service |
| **Role:** | The Care Plan Definition Service returns the requested PlanDefinition resource, or an error if the requested id does not exist. |

### 3.64.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.64.4 Interaction Diagram

Care Plan Contributor

Retrieve Plan Definition

Care Plan Definition Service

#### 3.64.4.1 Retrieve Plan Definition

The Care Plan Contributor retrieves a specific plan definition from the Care Plan Definition Service.

##### 3.64.4.1.1 Trigger Events

Any time a specific plan definition needs to be retrieved, for the purposes of viewing or in conjunction with the preparation for an update to a plan definition.

##### 3.64.4.1.2 Message Semantics

The message is a FHIR HTTP or HTTPS GET of a PlanDefinition resources where the parameter provided is the PlanDefinition.id with an option to ask for a specific version of the given PlanDefinition

The URL for this operation is: [base]/PlanDefinition/[id]

or, if this is an historical, version specific retrieval: [base]/PlanDefinition/[id]/\_history/[vid]

##### 3.64.4.1.3 Expected Actions

The Care Plan Contributor initiates the retrieve request using HTTP or HTTPS GET, and the Care Plan Definition Service responds according to the FHIR GET specification with the requested plan definition or an error message. See <http://hl7.org/fhir/STU3/http.html#read>

### 3.64.5 Security Considerations

See Section X.5 DCP Security Considerations

## Search 3.65 Search for Plan Definition [PCC-65]

### 3.65.1 Scope

This transaction is used to find a plan definition. The Care Plan Contributor searches for a plan definition of interest. A plan definition located by search may then be retrieved for viewing or updating.

### 3.65.2 Actor Roles

Care Plan Contributor

Care Plan Definition Service

Figure 3.65.2-1: Use Case Diagram

Table 3.65.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor initiates Search for Plan Definition in order to locate a plan definition of interest. |
| **Actor:** | Care Plan Definition Service |
| **Role:** | The Care Plan Definition Service responds to the Search for Plan Definition according to the search parameters and values provided in the transaction. |

### 3.65.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.65.4 Interaction Diagram

Care Plan Contributor

Search for Plan Definition

Care Plan Definition Service

#### 3.65.4.1 Search for Plan Definition

The Search for Plan Definition is implemented through the FHIR search operation using the REST platform constrained to the HTTP or HTTPS GET.

##### 3.65.4.1.1 Trigger Events

The Search for Plan Definition may be initiated for a number of different reasons:

1. need to view a plan definition;
2. need to update a portion of a plan definition
3. need to subscribe to updates for a plan definition

##### 3.65.4.1.2 Message Semantics

This is a standard FHIR search operation on the PlanDefinition resource. It SHALL use the HTTP or HTTPS GET protocol

The URL for this operation is: [base]/PlanDefinition/\_search

See the FHIR PlanDefinition resource Search Parameters at <http://hl7.org/fhir/STU3/planDefinition.html#search>

##### 3.65.4.1.3 Expected Actions

The Care Plan Contributor initiates the search using HTTP or HTTPS GET, and the Care Plan Definition Service responds according to the [FHIR Search specification](http://hl7.org/fhir/STU3/search.html) with zero or more plan definitions that match the search parameter values supplied with the search message. Specifically, the Care Plan Definition Service returns a [bundle](http://hl7.org/fhir/STU3/bundle.html) as the HTTP Response, where the bundle includes the resources that are the results of the search.

### 3.65.5 Security Considerations

See X.5 DCP Security Considerations.

## 3.66 Subscribe to Plan Definition Updates [PCC-66]

### 3.66.1 Scope

This transaction is used to subscribe to updates made to a Plan Definition.

Note: There is no transaction to unsubscribe from plan definition updates. However, to unsubscribe from plan definition updates, the Care Plan Definition Service SHALL support RESTful delete of the subscription resource. See <http://hl7.org/fhir/STU3/http.html#delete>.

### 3.66.2 Actor Roles

Care Plan Contributor

Care Plan Definition Service

Figure 3.66.2-1: Use Case Diagram

Table 3.66.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor subscribes to updates based upon changes to a PlanDefinition resource. |
| **Actor:** | Care Plan Definition Service |
| **Role:** | The Care Plan Definition Service evaluates the involved resources of the Subscription and uses the defined channel to notify a Care Plan Contributor about changes. |

### 3.66.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.66.4 Interaction Diagram

Care Plan Contributor

Subscribe to Plan Definition Updates

Care Plan Definition Service

#### 3.66.4.1 Subscribe to Plan Definition Updates

A Care Plan Contributor may choose to receive updates as PlanDefinition resources are changed by using the Subscribe to Plan Definition Updates transaction.

When the criteria of a subscription request are satisfied, the Care Plan Definition Service sends the entire Plan Definition resource, using the Provide Plan Definition [PCC-67] transaction to the subscribing Care Plan Contributor.

##### 3.66.4.1.1 Trigger Events

Subscribing to Plan Definition Updates is a business and workflow decision, and the use of this is optional in the DCP Profile.

The Subscription criteria, used to trigger updates, may be simple or complex.

Simple Subscription criteria includes only query parameters about a PlanDefinition resource, such as the id. Simple Subscription criteria results in notifications of changes to the PlanDefinition resource itself, but the subscription update would not be triggered by changes to a resource referenced by the plan definition.

Complex Subscription criteria contains chained parameters, such as parameters about resources that are referenced within the PlanDefinition. For example, chaining parameters about an ActivityDefinition referenced from a PlanDefinition results in notifications of changes to either the PlanDefinition or to the referenced ActivityDefinition.

##### 3.66.4.1.2 Message Semantics

This is an HTTP or HTTPS POST of a Subscription resource, as constrained by this profile.

The base URL for this is: [base]/Subscription

Where the body of the transaction contains the Subscription resource.

See <http://hl7.org/fhir/STU3/subscription.html>

##### 3.66.4.1.3 Expected Actions

The Care Plan Contributor shall check the response from the Care Plan Definition Service. See http://hl7.org/fhir/STU3/http.html#create for details.

The Care Plan Definition Service shall check that the Subscription resource meets the constraints defined by this profile, in PCC TF-3: 6.6.2.

When a Subscription resource is accepted, the Care Plan Definition Service sets the status to “requested” and returns in the Location header the Subscription’s logical id for use in future operations. This logical id shall be saved by the Care Plan Contributor.

A Subscription may be rejected by the Care Plan Definition Service for a number of reasons, such as if the Subscription is incomplete or does not meet the requirements of this profile as in PCC TF-3: 6.6.2

As per FHIR POST protocol, a rejected transaction results in the return of a 406 – rejected HTTP response.

#### 3.66.4.2 Update Subscription to Plan Definition Updates

An existing subscription may be updated by a Care Plan Contributor, for example to refine the search criteria.

##### 3.66.4.2.1 Trigger Events

An existing subscription needs to be updated.

##### 3.66.4.2.2 Message Semantics

This is an HTTP or HTTPS PUT of a Subscription resource, as constrained by this profile.

The base URL for this is: [base]/Subscription/[id]

Where the body of the transaction contains the Subscription resource.

See <http://hl7.org/fhir/STU3/http.html#update>

##### 3.66.4.2.3 Expected Actions

See <http://hl7.org/fhir/STU3/http.html#update>

### 3.66.5 Security Considerations

See X.5 DCP Security Considerations

## 3.67 Provide Plan Definition [PCC-67]

### 3.67.1 Scope

This transaction is used to provide an updated PlanDefinition resource to a Care Plan Contributor that has subscribed to updates.

### 3.67.2 Actor Roles

Care Plan Definition Service

Care Plan Contributor

Figure 3.67.2-1: Use Case Diagram

Table 3.67.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Definition Service |
| **Role:** | The Care Plan Definition Service provides updated PlanDefinition resources to subscribed Care Plan Contributors. |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor that has subscribed to plan definition updates receives updates of changed PlanDefinition resources. |

### 3.67.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.67.4 Interaction Diagram

Care Plan Definition Service

Provide Plan Definition

Care Plan Contributor

#### 3.67.4.1 Provide Plan Definition

The Care Plan Definition Service sends a PlanDefinition resource to the endpoint specified in the Subscription resource.

##### 3.67.4.1.1 Trigger Events

A change to a resource causes a Subscription Criteria to evaluate as true, so the Care Plan Definition Service sends the updated PlanDefinition resource to the designated endpoint.

##### 3.67.4.1.2 Message Semantics

This is an HTTP or HTTPS POST of a PlanDefinition resource, as constrained by this profile.

The base URL for this is specified in the registered Subscription resource.

Where the body of the transaction contains the PlanDefinition resource.

See http://hl7.org/fhir/STU3/subscription.html.

##### 3.67.4.1.3 Expected Actions

The Care Plan Contributor receives the PlanDefinition resource in the body of the POST.

### 3.67.5 Security Considerations

See X.5 DCP Security Considerations

## 3.68 Provide Activity Definition [PCC-68]

### 3.68.1 Scope

This transaction is used to provide an updated ActivityDefinition resource to a Care Plan Contributor that has subscribed to updates.

### 3.68.2 Actor Roles

Care Plan Definition Service

Care Plan Contributor

Figure 3.68.2-1: Use Case Diagram

Table 3.68.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Definition Service |
| **Role:** | The Care Plan Definition Service provides updated ActivityDefinition resources to subscribed Care Plan Contributors. |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor that has subscribed to activity definition updates receives updates of changed ActivityDefinition resources. |

### 3.68.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.68.4 Interaction Diagram

Care Plan Definition Service

Provide Activity Definition

Care Plan Contributor

#### 3.68.4.1 Provide Activity Definition

The Care Plan Definition Service sends an ActivityDefinition resource to the endpoint specified in the Subscription resource.

##### 3.68.4.1.1 Trigger Events

A change to a resource causes a Subscription Criteria to evaluate as true, so the Care Plan Definition Service sends the updated ActivityDefinition resource to the designated endpoint.

##### 3.68.4.1.2 Message Semantics

This is an HTTP or HTTPS POST of an ActivityDefinition resource, as constrained by this profile.

The base URL for this is specified in the registered Subscription resource.

Where the body of the transaction contains the ActivityDefinition resource.

See http://hl7.org/fhir/STU3/subscription.html

##### 3.68.4.1.3 Expected Actions

The Care Plan Contributor receives the ActivityDefinition resource in the body of the POST.

### 3.68.5 Security Considerations

See X.5 DCP Security Considerations

## 3.69 Apply Activity Definition Operation [PCC-69]

### 3.69.1 Scope

This transaction is used to generate a Care Plan and subsequent request or task resources. Care Plan Contributor receives Activity Definitions provided by the Care Plan Definition Service. A Care Plan is created. Subsequent request or task resources are generated based on the selected ActivityDefinition to be acted on. This is based on business rules determined by the Care Plan Contributor system. As described in Section X.4.2.2 Pregnancy Use Case, when the patient’s clinical status changes and the Care Plan is updated with Activity Definitions, the Care Plan Contributor generates request resources based on business rules. Request resources associated with the CarePlan.activity.reference are Appointment, CommunicationRequest, DeviceRequest, MedicationRequest, NutritionOrder, Task, ProcedureRequest, ReferralRequest , VisionPrescription, RequestGroup.

An optional possibility is that the process can be accomplished by tasks to be performed. In this case, the Care Plan Contributor generates FHIR Task resource from the Activity Definitions. The FHIR Task resource is used to support care planning workflow.

### 3.69.2 Actor Roles

Care Plan Contributor

Care Plan Service

Figure 3.69.2-1: Use Case Diagram

Table 3.69.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Care Plan Contributor |
| **Role:** | The Care Plan Contributor generates Care Plan with request resources |
| **Actor:** | Care Plan Service |
| **Role:** | The Care Plan Service receives submitted Care Plans for management as per FHIR Resource Integrity management. |

### 3.69.3 Referenced Standards

HL7 FHIR standard release 3 (STU)

### 3.69.4 Interaction Diagram

Care Plan Contributor

Care Plan Service

Apply Activity Definition Operation

#### 3.69.4.1 Apply Activity Definition Operation

The Care Plan Contributor receives Activity Definition resource provided by the Care Plan Definition using the Provide Activity Definition transaction (PCC-68). Care Plan Contributor uses FHIR $Apply operation to generate or update a Care Plan with corresponding request or task resources. The Care Plan Contributor uses existing business logic to act on the request or task resources in the generated Care Plan.

##### 3.69.4.1.1 Trigger Events

The Care Plan Contributor has received an updated ActivityDefinition resource and generates or updates a Care Plan containing request or task resource based on existing business logic.

##### 3.69.4.1.2 Message Semantics

Care Plan Contributor receives the POST containing the activity definition from the Care Plan Definition Service. Care Plan Contributor then utilizes FHIR $Apply operation to generate or update a Care Plan based on defined business logic. The Care Plan contains request or task resources. Business logic may also include generating or updating request or task resources. For example, business logic may determine that an Activity Definition include the need to create a procedureRequest resource. The procedureRequest resource is then sent to a laboratory system or a creation of a medicationRequest resource which is sent to a pharmacy system. Business logic may also include the handling of responses to the request resources. The updated or created Care Plan is managed by the Care Plan Service.

The base URL for this is: [base]/ActivityDefinition/[id]/$apply

Where the body of the transaction contains an ActivityDefinition resource.

See: <http://hl7.org/fhir/STU3/activitydefinition-operations.html#apply>

##### 3.69.4.1.3 Expected Actions

Based on business logic, Care Plan Contributor generates a Care Plan in the body of the POST. Subsequent use of apply operation will subsequently generate request or task resources based on the selected ActivityDefinition associated with the PlanDefinition.

### 3.69.5 Security Considerations

See X.5 DCP Security Considerations

Appendices

None

# Volume 2 Namespace Additions

Add the following terms to the IHE General Introduction Appendix G:

None

Volume 3 – Content Modules

# 5 Namespaces and Vocabularies

Add to Section 5 Namespaces and Vocabularies

NA

Add to Section 5.1.1 IHE Format Codes

NA

Add to Section 5.1.2 IHE ActCode Vocabulary

NA

Add to Section 5.1.3 IHE RoleCode Vocabulary

# 6 Content Modules

### 6.3.1 CDA®[[33]](#footnote-33) Content Modules

NA

## 6.6 HL7 FHIR Content Module

### 6.6.1 Care Plan

The following table shows the DynamicCarePlan StructureDefinition, which constrains the CarePlan resource. The below table is a conceptual representation of the FHIR StuctureDefinition.

Table 6.6.1-1: CarePlan resource

| Name | Flags | Base Card. | DCP Constraint Card. | Description & Constraints | (Profile) Comments |
| --- | --- | --- | --- | --- | --- |
| .. CarePlan |  |  |  | Healthcare plan for patient |  |
| ...identifier | Σ | 0..\* | 1..\* | External Ids for this plan | This version of the profile requires at least one identifier. |
| … definition | Σ | 0..\* |  | Protocol or definition |  |
| ... basedOn | Σ | 0..\* |  | Fulfills care plan (reference carePlan) | This version of the profile requires that a related DynamicCarePlan be referenced when basedOn |
| ... replaces | Σ | 0..\* |  | CarePlan replaced by this CarePlan (reference carePlan) | This version of the profile requires that a related DynamicCarePlan be referenced when replaced |
| ... partOf | Σ | 0..\* |  | Part of referenced CarePlan (reference carePlan) | This version of the profile requires that a related DynamicCarePlan be referenced when partOf |
| ... status | ?! | 1..1 |  | draft | active | suspended | completed | entered-in-error | cancelled | unknown |  |
| ... intent | ?! | 1..1 |  | proposal | plan | order | option |  |
| ... category | Σ | 0..\* | 1..\* | Type of plan | This version of the profile fixes the code system to SNOMED CT; http://snomed.info/sct |
| ... title | Σ | 0..1 |  | Human-friendly name for the CarePlan |  |
| ... description | Σ | 0..1 | 1..1 | Summary of nature of plan | This version of the profile requires a description |
| ... subject | Σ | 1..1 |  | Identifies the patient. | For this version of the profile, the use of group is not supported. |
| ... context | Σ | 0..1 |  | Created in context of | This profile allows for CarePlan creation outside of the context of an encounter or episode. |
| ... period | Σ | 0..1 | 1..1 | Time period plan covers | This version of the profile requires at least a start time for the CarePlan. |
| ... author | Σ | 0..\* | 1..\* | Who is responsible for contents of the plan | This version of the profile requires at least one author. |
| ... careTeam |  | 0..\* |  | Who's involved in plan? |  |
| ... addresses | Σ | 0..\* | 1..\* | Health issues this plan addresses | This version of the profile requires one of more addressed conditions/problems/concerns/diagnoses |
| ... supportingInfo |  | 0..\* |  | Information considered as part of plan (reference Any) |  |
| ... goal |  | 0..\* | 1..\* | Desired outcome of plan | This version of the profile requires at least one Goal. |
| ... activity | I | 0..\* |  | Action to occur as part of plan  Provide a reference or detail, not both |  |
| .... outcomeCodeableConcept |  | 0..\* |  | Results of the activity |  |
| .... outcomeReference |  | 0..\* |  | Appointment, Encounter, Procedure, etc. (reference Any) |  |
| .... progress |  | 0..\* |  | Annotation Comments about the activity status/progress |  |
| .... reference | I | 0..1 |  | Activity details defined in specific resource |  |
| .... detail |  | 0..1 |  | In-line definition of activity |  |
| ..... category | I | 0..1 |  | diet | drug | encounter | observation | procedure | supply | other  CarePlanActivityCategory (Example) |  |
| ..... definition |  | 0..1 |  | Protocol or definition |  |
| ..... code |  | 0..1 |  | Detail type of activity  Care Plan Activity (Example) |  |
| ..... reasonCode |  | 0..\* |  | Why activity should be done or why activity was prohibited  Activity Reason (Example) |  |
| ..... reasonReference |  | 0..\* |  | Condition triggering need for activity |  |
| ..... goal |  | 0..\* |  | Goals this activity relates to |  |
| ..... status | ?! | 1..1 |  | not-started | scheduled | in-progress | on-hold | completed | cancelled | unknown  CarePlanActivityStatus (Required) |  |
| ..... statusReason |  | 0..1 |  | Reason for current status  GoalStatusReason (Example) |  |
| ..... prohibited | ?! | 0..1 |  | Do NOT do |  |
| ..... scheduled |  | 0..1 |  | When activity is to occur |  |
| ...... scheduledTiming |  |  |  |  |  |
| ...... scheduledPeriod |  |  |  |  |  |
| ...... scheduledString |  |  |  |  |  |
| ..... location |  | 0..1 |  | Where it should happen |  |
| ..... performer |  | 0..\* |  | Who will be responsible? |  |
| ..... product |  | 0..1 |  | What is to be administered/supplied  SNOMED CT Medication Codes (Example) |  |
| ...... productCodeableConcept |  |  |  |  |  |
| ...... productReference |  |  |  |  |  |
| ..... dailyAmount |  | 0..1 |  | How to consume/day? |  |
| ..... quantity |  | 0..1 |  | How much to administer/supply/consume |  |
| ..... description |  | 0..1 |  | Extra info describing activity to perform |  |
| ... note |  | 0..\* |  | Annotation Comments about the plan |  |

A FHIR CarePlan StructureDefinition can be found in implementation materials – see ITI TF-2x: Appendix W for instructions on how to get to the implementation materials.

### 6.6.2 Subscription

The following table documents the CarePlanSubscription, which constrains the Subscription resource. The below table is a conceptual representation of the FHIR StuctureDefinition.

Table 6.6.2-1: Subscription resource

| Name | Flags | Base Card. | IHE PCC Constraint Card. | Description | Comments |
| --- | --- | --- | --- | --- | --- |
| .. Subscription | Σ |  |  | A server push subscription criteria |  |
| ...status | ?! Σ | 1..1 |  | requested | active | error | off |  |
| ...contact | Σ | 0..\* |  | Contact details for source (e.g., troubleshooting) |  |
| …end | Σ | 0..1 |  | When to automatically delete the subscription |  |
| ...reason | Σ | 1..1 |  | Description of why this subscription was created |  |
| …criteria | Σ | 1..1 |  | Rule for server push criteria |  |
| ...error | Σ | 0..1 |  | Latest error note |  |
| ...channel | Σ | 1..1 |  | The channel on which to report matches to the criteria |  |
| ....type | Σ | 1..1 |  | rest-hook | This version of the profile constrains the channel type to rest-hook. |
| ....endpoint | Σ | 0..1 | 1..1 | Where the channel points to | This version of the profile constrains the channel type to rest-hook, the endpoint must be a valid URL for the Provide Care Plan [PCC-40] transaction. |
| ....payload | Σ | 0..1 | 1..1 | Mimetype to send | This version of the profile constrains the channel payload to a non-blank value - the CarePlan resource must be the payload. |
| ....header | Σ | 0..\* |  | Usage depends on the channel type |  |
| ...tag | Σ | 0..\* |  | A tag to add to matching resources |  |

A FHIR Subscription StructureDefinition can be found in implementation materials – see ITI TF-2x: Appendix W for instructions on how to get to the implementation materials.

### 6.6.3 PlanDefinition

The following table shows the DynamicCarePlanPlanDefinition StructureDefinition, which constrains the planDefiniton resource.

Table 6.6.3-1: PlanDefinition resource

| Name | Flags | Base Card. | IHE PCC Constraint Card. | Description & Constraints | (Profile) Comments |
| --- | --- | --- | --- | --- | --- |
| .. PlanDefinition |  |  |  | PlanDefinition for care planning |  |
| … url | Σ | 0..1 | 1..1 | Logical URI to reference this plan definition (globally unique) | This version of the profile requires url where the library of PlanDefinitions are stored. |
| ...identifier | Σ | 0..\* | 1..\* | External Ids for this PlanDefinition | This version of the profile requires at least one identifier. |
| ... version | Σ | 0..1 | 1..1 | Business version of the plan definition | This version of the profile requires specifying the version of this PlanDefinition. |
| ... name | Σ | 0..1 | 1..1 | Name for this plan definition (computer friendly) | This version of the profile requires the name of the PlanDefinition |
| ... title | Σ | 0..1 | 1..1 | Name for this plan definition (human friendly) | This version of the profile requires a title which is used in an UI. |
| ... type | Σ | 0..1 |  | order-set | protocol | eca-rule |  |
| ... status | ?! Σ | 1..1 |  | draft | active | retired | unknown |  |
| ... experimental | ?! Σ | 0..1 |  | For testing purposes, not real usage |  |
| ... date | Σ | 0..1 | 1..1 | Date this was last changed | This version of the profile requires a date for when the PlanDefinition was last changed |
| ... publisher | Σ | 0..1 | 1..1 | Name of the publisher (organization or individual) | This version of the profile requires the name of the PlanDefinition publisher. |
| ... description | Σ | 0..1 | 1..1 | Natural language description of the plan definition | This version of the profile requires a description of the PlanDefinition. |
| ... purpose |  | 0..1 |  | Why this plan definition is defined |  |
| ... usage |  | 0..1 |  | Describes the clinical usage of the asset |  |
| ... approvalDate |  | 0..1 |  | When the plan definition was approved by publisher |  |
| ... lastReviewDate |  | 0..1 | 1..1 | When the plan definition was last reviewed | This version of the profile requires a date when the PlanDefinition was last reviewed. |
| ... effectivePeriod | Σ | 0..1 |  | When the plan definition is expected to be used |  |
| …. id |  | 0..1 |  | unique id for the element within a resource (for internal references). This may be any string value that does not contain spaces. |  |
| …. start |  | 0..1 | 1..1 | The start of the period. | This version of the profile requires an effectivePeriod of period.start when the PlanDefinition status value is active |
| …. end |  | 0..1 |  | The end of the period. |  |
| ... useContext | Σ | 0..\* | 1..\* | Context the content is intended to support | This version of the profile requires a useContext which is used to discover PlanDefinitions of similar useContext. Will be used to drive searches related to the patient’s condition. |
| ... jurisdiction | Σ | 0..\* |  | Intended jurisdiction for plan definition (if applicable) |  |
| ... topic |  | 0..\* |  | E.g., Education, Treatment, Assessment, etc. |  |
| ... contributor |  | 0..\* |  | A content contributor |  |
| .... contact | Σ | 0..\* |  | Contact details for the publisher |  |
| .... copyright |  | 0..1 |  | Use and/or publishing restrictions |  |
| .... relatedArtifact |  | 0..\* |  | Related artifacts for the asset |  |
| .... library |  | 0..\* |  | Logic used by the plan definition |  |
| .... goal |  | 0..\* |  | What the plan is trying to accomplish |  |
| ..... category |  | 0..1 |  | E.g., Treatment, dietary, behavioral, etc. |  |
| ..... description |  | 1..1 |  | Code or text describing the goal |  |
| ..... priority |  | 0..1 |  | high-priority | medium-priority | low-priority |  |
| ..... start |  | 0..1 |  | When goal pursuit begins |  |
| ..... addresses |  | 0..\* | 1..\* | What does the goal address | This version of the profile requires the concept the PlanDefinition.goal addresses. |
| ..... documentation |  | 0..\* |  | Supporting documentation for the goal |  |
| ..... target |  | 0..\* |  | Target outcome for the goal |  |
| ...... measure |  | 0..1 |  | The parameter whose value is to be tracked |  |
| ...... detail[x] |  | 0..1 |  | The target value to be achieved |  |
| ....... detailQuantity |  |  |  |  |  |
| ....... detailRange |  |  |  |  |  |
| ....... detailCodeableConcept |  |  |  |  |  |
| ...... due |  | 0..1 |  | Reach goal within |  |
| .... action |  | 0..\* | 1..\* | Action defined by the plan | This version of the profile requires action (ActivityDefinitions). |
| ..... label |  | 0..1 |  | User-visible label for the action (e.g., 1. or A.) |  |
| ..... title |  | 0..1 | 1..1 | User-visible title | This version of the profile requires a title of the action (ActivityDefinitions). |
| ..... description |  | 0..1 | 1..1 | Short description of the action | This version of the profile requires a description of the action (ActivityDefinitions). |
| ..... textEquivalent |  | 0..1 |  | Static text equivalent of the action, used if the dynamic aspects cannot be interpreted by the receiving system |  |
| ..... code |  | 0..\* |  | Code representing the meaning of the action or sub-actions |  |
| ..... reason |  | 0..\* |  | Why the action should be performed |  |
| ..... documentation |  | 0..\* |  | Supporting documentation for the intended performer of the action |  |
| ..... goalId |  | 0..\* |  | What goals this action supports |  |
| ..... triggerDefinition |  | 0..\* |  | When the action should be triggered |  |
| ..... condition |  | 0..\* |  | Whether or not the action is applicable |  |
| ...... kind |  | 1..1 |  | applicability | start | stop |  |
| ...... description |  | 0..1 |  | Natural language description of the condition |  |
| ...... language |  | 0..1 |  | Language of the expression |  |
| ...... expression |  | 0..1 |  | Boolean-valued expression |  |
| ..... input |  | 0..\* |  | Input data requirements |  |
| ..... output |  | 0..\* |  | Output data definition |  |
| ..... relatedAction |  | 0..\* |  | Relationship to another action |  |
| ...... actionId |  | 1..1 |  | What action is this related to |  |
| ...... relationship |  | 1..1 |  | before-start | before | before-end | concurrent-with-start | concurrent | concurrent-with-end | after-start | after | after-end |  |
| ...... offset[x] |  | 0..1 |  | Time offset for the relationship |  |
| ....... offsetDuration |  |  |  |  |  |
| ....... offsetRange |  |  |  |  |  |
| ...... timing[x] |  | 0..1 |  | When the action should take place |  |
| ....... timingDateTime |  |  |  |  |  |
| ....... timingPeriod |  |  |  |  |  |
| ....... timingDuration |  |  |  |  |  |
| ....... timingRange |  |  |  |  |  |
| ....... timingTiming |  |  |  |  |  |
| ...... participant |  | 0..\* |  | Who should participate in the action |  |
| ....... type |  | 1..1 |  | patient | practitioner | related-person |  |
| ....... role |  | 0..1 |  | E.g., Nurse, Surgeon, Parent, etc. |  |
| ...... type |  | 0..1 |  | create | update | remove | fire-event |  |
| ...... groupingBehavior |  | 0..1 |  | visual-group | logical-group | sentence-group |  |
| ...... selectionBehavior |  | 0..1 |  | any | all | all-or-none | exactly-one | at-most-one | one-or-more |  |
| ...... requiredBehavior |  | 0..1 |  | must | could | must-unless-documented |  |
| ...... precheckBehavior |  | 0..1 |  | yes | no |  |
| ...... cardinalityBehavior |  | 0..1 |  | single | multiple |  |
| ...... definition |  | 0..1 | 1..1 | Description of the activity to be performed | This version of the profile requires ActivityDefinitions referenced by the PlanDefinition |
| ...... transform |  | 0..1 |  | Transform to apply the template |  |
| ...... dynamicValue |  | 0..\* |  | Dynamic aspects of the definition |  |
| ....... description |  | 0..1 |  | Natural language description of the dynamic value |  |
| ....... path |  | 0..1 |  | The path to the element to be set dynamically |  |
| ....... language |  | 0..1 |  | Language of the expression |  |
| ....... expression |  | 0..1 |  | An expression that provides the dynamic value for the customization |  |
| ...... action |  | 0..\* |  | A sub-action |  |

A FHIR PlanDefinition StructureDefinition can be found in implementation materials – see ITI TF-2x: Appendix W for instructions on how to get to the implementation materials.

### 6.6.4 ActivityDefinition

The following table shows the DynamicCarePlanActivityDefinition StructureDefinition, which constrains the activityDefiniton resource. It is important to note that ActivityDefinition.kind is the kind of resource the activity definition defines as resources to be used. For the purposed of this profile, the following Request resources SHOULD be used and SHALL be referenced from CarePlan.activity.reference: Appointment; CommunicationRequest; DeviceRequest; MedicationRequest; NutritionOrder; Task; ProcedureRequest; ReferralRequest; VisionPrescription; RequestGroup

Table 6.6.4-1: ActivityDefinition resource

| Name | Flags | Base Card. | IHE PCC Constraint Card. | Description & Constraints | (Profile) Comments |
| --- | --- | --- | --- | --- | --- |
| .. ActivityDefinition |  |  |  | ActivityDefinition for care planning |  |
| … url | Σ | 0..1 | 1..1 | Logical URI to reference this activity definition (globally unique) | This version of the profile requires url where the library of ActivityDefinitions are stored. |
| ... identifier | Σ | 0..\* | 1..\* | External Ids for this ActivityDefinition | This version of the profile requires at least one identifier. |
| ... version | Σ | 0..1 | 1..1 | Business version of the activity definition | This version of the profile requires specifying the version of this ActivityDefinition. |
| ... name | Σ | 0..1 | 1..1 | Name for this activity definition (computer friendly) | This version of the profile requires the name of the ActivityDefinition |
| ... title | Σ | 0..1 | 1..1 | Name for this plan definition (human friendly) | This version of the profile requires a title which is used in an UI. |
| ... status | ?! Σ | 1..1 |  | draft | active | retired | unknown |  |
| ... experimental | ?! Σ | 0..1 |  | For testing purposes, not real usage |  |
| ... date | Σ | 0..1 | 1..1 | Date this was last changed | This version of the profile requires a date for when the ActivityDefinition was last changed |
| ... publisher | Σ | 0..1 | 1..1 | Name of the publisher (organization or individual) | This version of the profile requires the name of the ActivityDefinition publisher. |
| ... description | Σ | 0..1 | 1..1 | Natural language description of the activity definition | This version of the profile requires a description of the ActivityDefinition. |
| ... purpose |  | 0..1 |  | Why this activity definition is defined |  |
| ... usage |  | 0..1 |  | Describes the clinical usage of the asset |  |
| ... approvalDate |  | 0..1 |  | When the activity definition was approved by publisher |  |
| ... lastReviewDate |  | 0..1 | 1..1 | When the activity definition was last reviewed | This version of the profile requires a date when the ActivityDefinition was last reviewed. |
| ... effectivePeriod | Σ | 0..1 |  | When the activity definition is expected to be used |  |
| …. id |  | 0..1 |  | unique id for the element within a resource (for internal references). This may be any string value that does not contain spaces. |  |
| …. start |  | 0..1 | 1..1 | The start of the period. | This version of the profile requires an effectivePeriod of period.start when the ActivityDefinition status value is active |
| …. end |  | 0..1 |  | The end of the period. |  |
| ... useContext | Σ | 0..\* | 1..\* | Context the content is intended to support | This version of the profile requires a useContext which is used to discover ActivityDefinitions of similar useContext. |
| ... jurisdiction | Σ | 0..\* |  | Intended jurisdiction for activity definition (if applicable) |  |
| ... topic |  | 0..\* |  | E.g., Education, Treatment, Assessment, etc. |  |
| ... contributor |  | 0..\* |  | A content contributor |  |
| .... contact | Σ | 0..\* |  | Contact details for the publisher |  |
| .... copyright |  | 0..1 |  | Use and/or publishing restrictions |  |
| .... relatedArtifact |  | 0..\* |  | Additional documentation, citations, etc. |  |
| .... library |  | 0..\* |  | Logic used by the asset |  |
| .... kind |  | 0..1 | 1..1 | Kind of resource | This version of the profile requires kind which is used to generate the request resources. |
| .... code |  | 0..1 |  | Detail type of activity |  |
| .... timing[x] |  | 0..1 | 1..1 | When activity is to occur | This version of the profile requires timing of when the ActivityDefinition is to occur. |
| ..... timingTiming |  |  |  |  |  |
| ..... timingDateTime |  |  |  |  |  |
| ..... timingPeriod |  |  |  |  |  |
| ..... timingRange |  |  |  |  |  |
| .... location |  | 0..1 |  | Where it should happen |  |
| .... participant |  | 0..\* |  | Who should participate in the action |  |
| ..... type |  | 1..1 |  | Patient | practitioner | related-person |  |
| ..... role |  | 0..1 |  | E.g., Nurse, Surgeon, Parent, etc. |  |
| .... product |  | 0..1 |  | What's administered/supplied |  |
| ..... productReference |  |  |  |  |  |
| ..... productCodeableCOncept |  |  |  |  |  |
| .... quantity |  | 0..1 |  | How much is administered/consumed/supplied |  |
| .... dosage |  | 0..\* |  | Detailed dosage instructions |  |
| .... bodySite |  | 0..\* |  | What part of body to perform on |  |
| .... transform |  | 0..1 |  | Transform to apply the template |  |
| .... dynamicValue |  | 0..\* |  | Dynamic aspects of the definition |  |
| ..... description |  | 0..1 |  | Natural language description of the dynamic value |  |
| ..... path |  | 0..1 |  | The path to the element to be set dynamically |  |
| ..... language |  | 0..1 |  | Language of the expression |  |
| ..... expression |  | 0..1 |  | An expression that provides the dynamic value for the customization |  |

A FHIR ActivityDefinition StructureDefinition can be found in implementation materials – see ITI TF-2x: Appendix W for instructions on how to get to the implementation materials.

### 6.6.5 Task

Task resources are resources that represent a task to be performed. Task resources can be one of ActivityDefinition.kind which is the kind of resource the activity definition defines as request resources to be used. The purpose of profiling the task resource is to support cases when the Task resource is used to support care planning workflow. In this situation, the PlanDefinition uses the Task resource to leverage care planning.

The following table shows the DynamicCarePlanTask StructureDefinition, which constrains the Task resource when the Task resource is used for the care planning process. It is important to note that Task resources can be one of ActivityDefinition.kind which is the kind of resource the activity definition defines as resources to be used.

Table 6.6.5-1: Task resource

| Name | Flags | Base Card. | IHE PCC Constraint Card. | Description & Constraints | (Profile) Comments |
| --- | --- | --- | --- | --- | --- |
| .. Task |  |  |  | A task to be performed |  |
| ... identifier | Σ | 0..\* | 1..\* | External Ids for this task | **This version of the profile requires at least one identifier.** |
| ... definition[x] | Σ | 0..1 | 1..1 | Formal definition of task | **This version of the profile requires at least one definition.** |
| .... definitionUri |  |  |  |  |  |
| .... definitionReference |  |  |  |  |  |
| ... basedOn | Σ | 0..\* |  | Request fulfilled by this task |  |
| ... groupIdentifier | Σ | 0..1 |  | Requisition or grouper id |  |
| ... partOf | Σ | 0..\* |  | Composite task |  |
| ... status | Σ | 1..1 |  | draft | requested | received | accepted | + |  |
| ... statusReason | Σ | 0..1 |  | Reason for current status |  |
| ... businessStatus | Σ | 0..1 |  | E.g., "Specimen collected", "IV prepped" |  |
| ... intent | Σ | 0..1 |  | proposal | plan | order + |  |
| ... priority |  | 0..1 |  | normal | urgent | asap | stat |  |
| ... code | Σ | 0..1 | 1..1 | Task Type | **This version of the profile requires a code.** |
| ... description | Σ | 0..1 | 1..1 | Human-readable explanation of task | **This version of the profile requires a description.** |
| ... focus | Σ | 0..1 |  | What task is acting on |  |
| ... for | Σ | 0..1 |  | Beneficiary of the Task |  |
| ... context | Σ | 0..1 |  | Healthcare event during which this task originated |  |
| ... executionPeriod | Σ | 0..1 |  | Start and end time of execution |  |
| ... authoredOn | I | 0..1 | 1..1 | Task Creation Date | **This version of the profile requires an authoredOn.** |
| ... lastModified | Σ I | 0..1 | 1..1 | Task Last Modified Date | **This version of the profile requires a lastModified.** |
| ... requester | Σ | 0..1 | 1..1 | Who is asking for task to be done | **This version of the profile requires a requester.** |
| .... agent | Σ | 1..1 |  | Individual asking for task |  |
| .... onBehalfOf |  | 0..1 |  | Organization individual is acting for |  |
| ... performerType |  | 0..\* |  | requester | dispatcher | scheduler | performer | monitor | manager | acquirer | reviewer |  |
| ... owner | Σ | 0..1 | 1..1 | Responsible individual | **This version of the profile requires an owner.** |
| ... reason |  | 0..1 |  | Why task is needed |  |
| ... note |  | 0..\* |  | Comments made about the task |  |
| ... relevantHistory |  | 0..\* |  | Key events in history of the Task |  |
| ... restrictions |  | 0..1 |  | Constraints on fulfillment tasks |  |
| .... repetitions |  | 0..1 |  | How many times to repeat |  |
| .... period |  | 0..1 |  | When fulfillment sought |  |
| .... recipient |  | 0..\* |  | For whom is fulfillment sought? |  |
| ... input |  | 0..\* |  | Information used to perform task |  |
| .... type |  | 1..1 |  | Label for the input |  |
| .... value[x] |  | 1..1 |  | Content to use in performing the task |  |
| ... output |  | 0..\* |  | Information produced as part of task |  |
| .... type |  | 1..1 |  | Label for output |  |
| .... value[x] |  | 1..1 |  | Result of output |  |

### 6.6.6 dctmCareTeam

The following table shows the DynamicCareTeamManagement StructureDefinition, which constrains the CareTeam resource. Constraints applied to the CareTeam base resource by this profile are shown in bold. The below table is a conceptual representation of the FHIR StuctureDefinition.

Table 6.6.1-2: CareTeam resource

| Name | Card. | Description & Constraints | Comments |
| --- | --- | --- | --- |
| .. CareTeam |  | Planned participants in the coordination and delivery of care for a patient or group |  |
| ... identifier | 1..\* | External Ids for this team | **This version of the profile requires at least one identifier.** |
| ... identifier.value | 1..1 |  | **This version of the profile requires an ID identifying this profile as an IHE PCC Dynamic Care Team** |
| ... status | 1..1 | proposed | active | suspended | inactive | entered-in-error | **This version of the profile requires the status of the care team.** |
| ... category | 0.. \* | Type of team |  |
| ... name | 1..1 | Name of the team | **This version of the profile requires the name of the care team.** |
| ... subject | 1..1 | The patient who care team is for | **For this version of the profile, the use of group is not supported.** |
| ... context | 0..1 | Encounter or episode associated with CareTeam | **This profile allows for CareTeam creation outside of the context of an encounter or episode.** |
| ... period | 1..1 | Time period team covers | **This version of the profile requires period for the CareTeam.** |
| …. start | 1..1 |  | **This version of the profile requires at least a start time for the CareTeam.** |
| ... participant | 0..\* | Members of the team | **It is possible for a care team to be set up with roles specified only, before actual participants are invited into or identified as team members** |
| .... role | 0..1 | Type of involvement |  |
| .... member | 1..1 | Who is involved | Need to know who the member is if participant is required.  This version of the profile requires that a DynamicCareTeam be referenced when the member is a care team. |
| .... onBehalfOf | 0..1 | Organization of the practitioner |  |
| .... period | 0..1 | Time period of participant | This version of the profile requires period to indicate how current the participant is. |
| ... reasonCode | 0.. \* | Why the care team exists |  |
| ... reasonReference | 0.. \* | Why the care team exists |  |
| ... managingOrganization | 0.. \* | Organization responsible for the care team |  |
| ... note | 0.. \* | Comments made about the CareTeam |  |

A FHIR StructureDefinition can be found in implementation materials – see ITI TF-2x: Appendix W for instructions on how to get to the implementation materials.

### 6.6.2 dctmSubscription

The following table documents the CareTeamSubscription, which constrains the Subscription resource. Changes to the base Subscription resource are shown in bold. The below table is a conceptual representation of the FHIR StuctureDefinition.

Table 6.6.2-1: Subscription resource

| Name | Card. | Description | Comments |
| --- | --- | --- | --- |
| .. Subscription |  | A server push subscription criteria |  |
| ...status | 1..1 | requested | active | off | off |  |
| ...contact | 0..\* | Contact details for source (e.g., troubleshooting) |  |
| …end | 0..1 | When to automatically delete the subscription |  |
| ...reason | 1..1 | Description of why this subscription was created |  |
| …criteria | 1..1 | Rule for server push criteria |  |
| ...error | 0..1 | Latest error note |  |
| ...channel | 1..1 | The channel on which to report matches to the criteria |  |
| ....type | 1..1 | **rest-hook** | **This version of the profile constrains the channel type to rest-hook.** |
| ....endpoint | 1..1 | Where the channel points to | **This version of the profile constrains the channel type to rest-hook, the endpoint must be a valid URL for the Provide Care Team [PCC-49] transaction.** |
| ....payload | 1..1 | Mimetype to send | **This version of the profile constrains the channel payload to a non-blank value - the CareTeam resource must be the payload.** |
| ....header | 0..\* | Usage depends on the channel type |  |
| ...tag | 0..\* | A tag to add to matching resources |  |

A FHIR Task StructureDefinition can be found in implementation materials – see ITI TF-2x: Appendix W for instructions on how to get to the implementation materials.

Appendices

# Appendix D – DCP Proposed Mapping to XDW Profiles

Cross-Enterprise Document Workflow (XDW) is a profile that provides the ability to define and manage workflows by sharing XDW “Workflow Document”. XDW Workflow Document keeps track of the state (current and previous) and all related input/output Documents involved in the workflow process.

XDW Workflow Document is made up of selected XDW “tasks” that defines all the needed process that completes the workflow. The list of needed process is the XDW “Workflow Definition”.

The DCP Profile provides the ability to use Plan Definition and its referenced Activity Definitions to create actions. The actions created by the Activity Definition resource can be used as part of the care planning process. FHIR Task resource is one of the resources used in the care planning process. There exists a lot of similarity between XDW and DCP constructs. The following section provides a comparison between XDW and DCP elements as it relates to care planning.

## D.1 Concepts

Starting from the strong relations existing between DCP and XDW Profiles, it’s possible to individuate a parallelism between the objects involved in these two profiles:

1. The Plan Definition provides support for Activity Definition to support the care planning process in the DCP Profile. This can be correlated with the Workflow Definition defined in XDW Profiles.
2. The Activity Definition references the Task resource which can correlated with XDW Task defined in the XDW Workflow Definition.
3. The FHIR Care Plan use of the FHIR Task resource can be correlated with XDW Workflow Document as defined in XDW Profile.
4. The Activity Definition’s referenced request and task resources as used by the DCP can be correlated with active XDW Tasks used in an XDW application. The FHIR Task resource has been profiled to support this workflow (see Section 6.6.5).

## D.2 DCP to XDW Concept Mapping

In an XDW environment, DCP transactions can be mapped to XDW transactions using the following guideline:

1. [PCC-37] Update Care Plan transaction can be mapped to the creation of a Workflow Document. When this transaction is used to update a Care Plan, the mapping lead to the update of the Workflow Document already created. The Workflow Document elements shall be defined per the concept mappings below.
2. [PCC-38] Retrieve Care Plan transaction can be mapped to the retrieve of a Workflow Document.
3. [PCC-41] Search for Care Plan transaction can be mapped to a query for searching Workflow Documents.

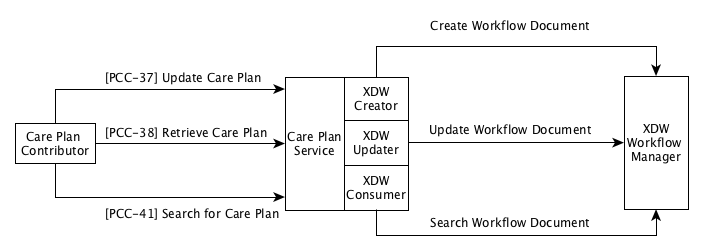


Figure D.2-1: DCP to XDW Concept Mapping Diagram

### D.2.1 Mapping DCP CarePlan resource to XDW Workflow Document

The purpose of this mapping exercise is to demonstrate a situation in which the DCP FHIR based profile and XDW Profiles can correlate. In order to support this, mapping between DCP CarePlan resources and XDW Workflow Document is provided below. The purpose for doing this is to support the ability for DCP Care Plan Service that receives a CarePlan with referenced Task resources, will be able to translate this information into an XDW Workflow Document.

Table D.2.1-1: DCP CarePlan resource to XDW Workflow Mapping

| CarePlan resource elements | Description | XDW Workflow Document elements | Notes |
| --- | --- | --- | --- |
| id | Document Id | id |  |
| meta | meta elements for resource | Mapping defined on children elements |  |
| … versionId | |  | | --- | | The version specific identifier, as it  appears in the version portion of the  URL. This value changes when the resource is created, updated, or deleted. | | workflowDocumentSequenceNumber |  |
| … lastUpdated | When the last update occurred | effectiveTime |  |
| … security | Security labels applied to this resource | confidentialityCode |  |
| implicitRules | A reference to a set of rules that were followed when the resource was constructed, and which must be understood when processing the content. (uri) | workflowDefinitionReference (urn:oid: that defines the kind of Workflow Document) | Could be the solution for FHIR typeCode |
| identifier | External Ids for this plan. This version of the profile requires at least one identifier | workflowInstanceId |  |
| definition | Protocol or definition | TaskList/XDWTask/TaskData/input for the first task with FHIR resource PlanDefinition |  |
| basedOn | Fulfills care plan (reference carePlan). This version of the profile requires that a related DynamicCarePlan be referenced when basedOn | TaskList/XDWTask/TaskData/input for the first task with FHIR resource CarePlan |  |
| replaces | CarePlan replaced by this CarePlan (reference carePlan). This version of the profile requires that a related DynamicCarePlan be referenced when replaced | TaskList/XDWTask/TaskData/input for the first task with FHIR resource CarePlan |  |
| partOf | Part of referenced CarePlan (reference carePlan). This version of the profile requires that a related DynamicCarePlan be referenced when part of. | TaskList/XDWTask/TaskData/input for the first task with FHIR resource CarePlan |  |
| status | draft | active | suspended | completed | entered-in-error | cancelled | unknown | workflowStatus |  |
| intent | proposal | plan | order | option | no mapping |  |
| category | Type of plan. This version of the profile fixes the code system to SNOMED CT; http://snomed.info/sct | no mapping |  |
| title | Human-friendly name for the CarePlan | title |  |
| description | Summary of nature of plan. This version of the profile requires a description | no mapping |  |
| subject | Identifies the patient. For this version of the profile, the use of group is not supported. | patient. Patient/id element can be found in the Patient resource referenced in CarePlan/subject element |  |
| context | Created in context of. This profile allows for CarePlan creation outside of the context of an encounter or episode | TaskList/XDWTask/TaskData/input for the first task with FHIR resource Encounter or EpisodeOfCare |  |
| period | Time period plan covers. This version of the profile requires at least a start time for the CarePlan | no mapping |  |
| author | Who is responsible for contents of the plan. This version of the profile requires at least one author | author/assignedAuthor. author/assignedAuthor/id element can be found in the resource referenced in CarePlan/author element |  |
| careTeam | Who's involved in plan? | no mapping |  |
| addresses | Health issues this plan addresses. This version of the profile requires one of more addressed conditions/problems/concerns/diagnoses | no mapping |  |
| supportingInfo | Information considered as part of plan (reference Any) | TaskList/XDWTask/TaskData/input or TaskList/XDWTask/TaskData/output of a specific task |  |
| goal | Desired outcome of plan. This version of the profile requires at least one Goal. | no mapping |  |
| activity | Action to occur as part of plan  Provide a reference or detail, not both | Contains the list of Task references. Mapping is performed on the children elements |  |
| … outcomeCodeableConcept | Results of the activity | no mapping |  |
| … outcomeReference | Appointment, Encounter, Procedure, etc. (reference Any) | TaskList/XDWTask/TaskData/output of the task referenced in activity/reference element |  |
| … progress | Annotation Comments about the activity status/progress | no mapping |  |
| … reference | Activity details defined in specific resource | Reference to Task resource – Mapping is on the Task resource (see **Table 7.3.3-1**) |  |
| … details | In-line definition of activity | General details of Task resource. Mapping is on children elements. |  |
| …. category | diet | drug | encounter | observation | procedure | supply | other  CarePlanActivityCategory (Example) | no mapping |  |
| …. definition | Protocol or definition | TaskList/XDWTask/TaskData/input with FHIR resource ActivityDefinition |  |
| …. code | Detail type of activity  Care Plan Activity (Example) | no mapping |  |
| …. reasonCode | Why activity should be done or why activity was prohibited  Activity Reason (Example) | no mapping |  |
| …. reasonReference | Condition triggering need for activity | no mapping |  |
| …. goal | Goals this activity relates to | no mapping |  |
| …. status | not-started | scheduled | in-progress | on-hold | completed | cancelled | unknown  CarePlanActivityStatus (Required) | TaskList/XDWTask/TaskData/TaskDetails/status |  |
| …. statusReason | Reason for current status  GoalStatusReason (Example) | no mapping |  |
| …. prohibited | Do NOT do | no mapping |  |
| …. Scheduled[x] | When activity is to occur | no mapping |  |
| ….. scheduledTiming |  | no mapping |  |
| ….. scheduledPeriod |  | no mapping |  |
| …. scheduledString |  | no mapping |  |
| …. location | Where it should happen | no mapping |  |
| …. performer | Who will be responsible? | TaskList/XDWTask/TaskData/TaskDetails/actualOwner |  |
| …. product[x] | What is to be administered/supplied  SNOMED CT Medication Codes (Example) | no mapping |  |
| ….. productCodeableConcept | CodeableConcept | no mapping |  |
| ….. productReference | Reference (Medication | Substance) | no mapping |  |
| …. dailyAmount | How to consume/day? | no mapping |  |
| …. quantity | How much to administer/supply/consume | no mapping |  |
| …. description | Extra info describing activity to perform | no mapping |  |
| note | Annotation Comments about the plan | no mapping |  |

### D.2.2 Mapping XDW Workflow Document History to CarePlan and Task Resource Ancestor Elements

The table below contains XDW Workflow Document history elements. Consideration should be given for use of Provenance resource versus use of the CarePlan resource ancestor elements.

Table D.2.2-1: XDW Workflow Document History to CarePlan and Task Resource Mapping

| XDW Workflow Document history | | Description | CarePlan or Task resource | Notes |
| --- | --- | --- | --- | --- |
| workflowStatusHistory/documentEvent | | A detailed event that represents a change of the workflowStatus. The first documentEvent element is added when the workflow document is created. A documentEvent element is then added whenever the workflowStatus of the workflow document changes. | Mapping defined on children elements |  |
|  | eventTime | Time when the specific documentEvent element is added to the workflow document | Time of the transaction for a CarePlan/status change |  |
|  | eventType | The type of event that happens that solicits the modification of the workflowStatus. It should be valorized with one of these types: create, stop, suspend, resume, fail, complete | no mapping |  |
|  | taskEventIdentifier | Element that permits to track the reference to the taskEvent that solicits the modification of the workflowStatus. It stores the same value of the element taskEvent/identifier of the taskEvent of reference | Task/identifier of the Task resource that has led to the CarePlan/status change |  |
|  | author | Actual owner of the workflow after the event | Task/owner of the task that has led to the CarePlan/status change |  |
|  | previousStatus | The previous value of workflowStatus. Either “OPEN” or “CLOSED”. In case of a Workflow Document just created this element shall be valorized with “” | CarePlan/status from the previous versions of CarePlan |  |
|  | actualStatus | Equal to the current value of the workflowStatus element. Either “OPEN” or “CLOSED”. | CarePlan/status |  |

### D.2.3 Mapping Task Resource to XDW Workflow Document Elements

The following table contains mapping between the Task resource and XDW Workflow Document elements.

Table D.2.3-1: Task Resource to XDW Workflow Document Mapping

| Task resource elements | | Description | XDW Workflow Document elements | Notes |
| --- | --- | --- | --- | --- |
| identifier | | External Ids for this task. This version of the profile requires at least one identifier. | TaskList/XDWTask/TaskData/TaskDetails/id |  |
| definitionReference | | Formal definition of task. This version of the profile requires at least one definition. | TaskList/XDWTask/TaskData/input |  |
| basedOn | | Request fulfilled by this task | TaskList/XDWTask/TaskData/input containing the reference to a FHIR resource |  |
| groupIdentifier | | Requisition or grouper id | no mapping |  |
| partOf | | Composite task | TaskList/XDWTask/TaskData/input containing the reference to a FHIR resource |  |
| status | | draft | requested | received | accepted | + | TaskList/XDWTask/TaskData/TaskDetails/status |  |
| statusReason | | Reason for current status | no mapping |  |
| businessStatus | | E.g., "Specimen collected", "IV prepped" | no mapping |  |
| intent | | proposal | plan | order + | no mapping |  |
| priority | | normal | urgent | asap | stat | TaskList/XDWTask/TaskData/TaskDetails/priority |  |
| code | | Task Type. This version of the profile requires a code. | TaskList/XDWTask/TaskData/TaskDetails/taskType |  |
| description | | Human-readable explanation of task. This version of the profile requires a description. | TaskList/XDWTask/TaskData/TaskDetails/name |  |
| focus | | What task is acting on | no mapping |  |
| for | | Beneficiary of the Task | no mapping |  |
| context | | Healthcare event during which this task originated | no mapping |  |
| executionPeriod | | Start and end time of execution | no mapping |  |
| authoredOn | | Task Creation Date | taskDetails/createdTime |  |
| lastModified | | Task Last Modified Date | taskDetails/lastModifiedTime |  |
| requester | | Who is asking for task to be done | taskDetails/createdBy |  |
|  | agent | Individual asking for task | taskDetails/taskInitiator |  |
|  | onBehalfOf | Organization individual is acting for | no mapping |  |
| performerType | | requester | dispatcher | scheduler | performer | monitor | manager | acquirer | reviewer | no mapping |  |
| owner | | Responsible individual | TaskList/XDWTask/TaskData/TaskDetails/actualOwner |  |
| reason | | Why task is needed | no mapping |  |
| note | | Comments made about the task | taskData/comments |  |
| relevantHistory | | Key events in history of the Task | no mapping |  |
| restrictions | | Constraints on fulfillment tasks | no mapping |  |
|  | repetitions | How many times to repeat | no mapping |  |
|  | period | When fulfillment sought | no mapping |  |
|  | recipient | For whom is fulfillment sought? | no mapping |  |
| input | | Information used to perform task | TaskList/XDWTask/TaskData/TaskDetails/input |  |
|  | type | Label for the input | no mapping |  |
|  | value[x] | Content to use in performing the task | Elements of input/part/attachmentInfo |  |
| output | | Information produced as part of task | TaskList/XDWTask/TaskData/TaskDetails/output |  |
|  | type | Label for output | no mapping |  |
|  | value[x] | Result of output | Elements of output/part/attachmentInfo |  |

### D.2.4 Mapping XDW Task History Required Elements to CarePlan and Task Resource

The following table contains mapping of the XDW Task History required elements to CarePlan and Task Resource.

Table D.2.4-1: XDW Task History Required Elements to CarePlan and Task Resource Mapping

| XDW Task history | | Description | CarePlan or Task resource | Notes |
| --- | --- | --- | --- | --- |
| taskEventHistory/taskEvent | | A detailed event that represents a change of the task status | Mapping is performed on children elements |  |
|  | id |  | no mapping | Shall be defined or can be set when element is created? |
|  | eventTime | Time when the specific taskEvent element is added to the workflow document | Time of the transaction for Task/status change |  |
|  | identifier | Identifier for the task | Task/identifier |  |
|  | eventType | The type of event that happens that solicits the modification of the status of the task (adding a new taskEvent). It should be valorized with one of these types: create, stop, suspend, resume, fail, complete. | no mapping |  |
|  | status | Status of the task | Task/status from the current Task and the previous Task (see history of Task resource) |  |

# Volume 3 Namespace Additions

None

Add the following terms to the IHE Namespace:

Volume 4 – National Extensions

Add appropriate Country section

None

1. HL7 is the registered trademark of Health Level Seven International. [↑](#footnote-ref-1)
2. FHIR is the registered trademark of Health Level Seven International. [↑](#footnote-ref-2)
3. Care Plan Project - PCWG. (2015, November 5). Retrieved February 15, 2016, from <http://wiki.hl7.org/index.php?title=Care_Plan_Project_-_PCWG>

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5. Care Plan Project - PCWG. (2015, November 5). Retrieved February 15, 2016, from <http://wiki.hl7.org/index.php?title=Care_Plan_Project_-_PCWG>

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6. Retrieved January 3, 2018 from <http://hl7.org/fhir/plandefinition.html> [↑](#footnote-ref-6)
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33. CDA is the registered trademark of Health Level Seven International. [↑](#footnote-ref-33)