



INTEROPen



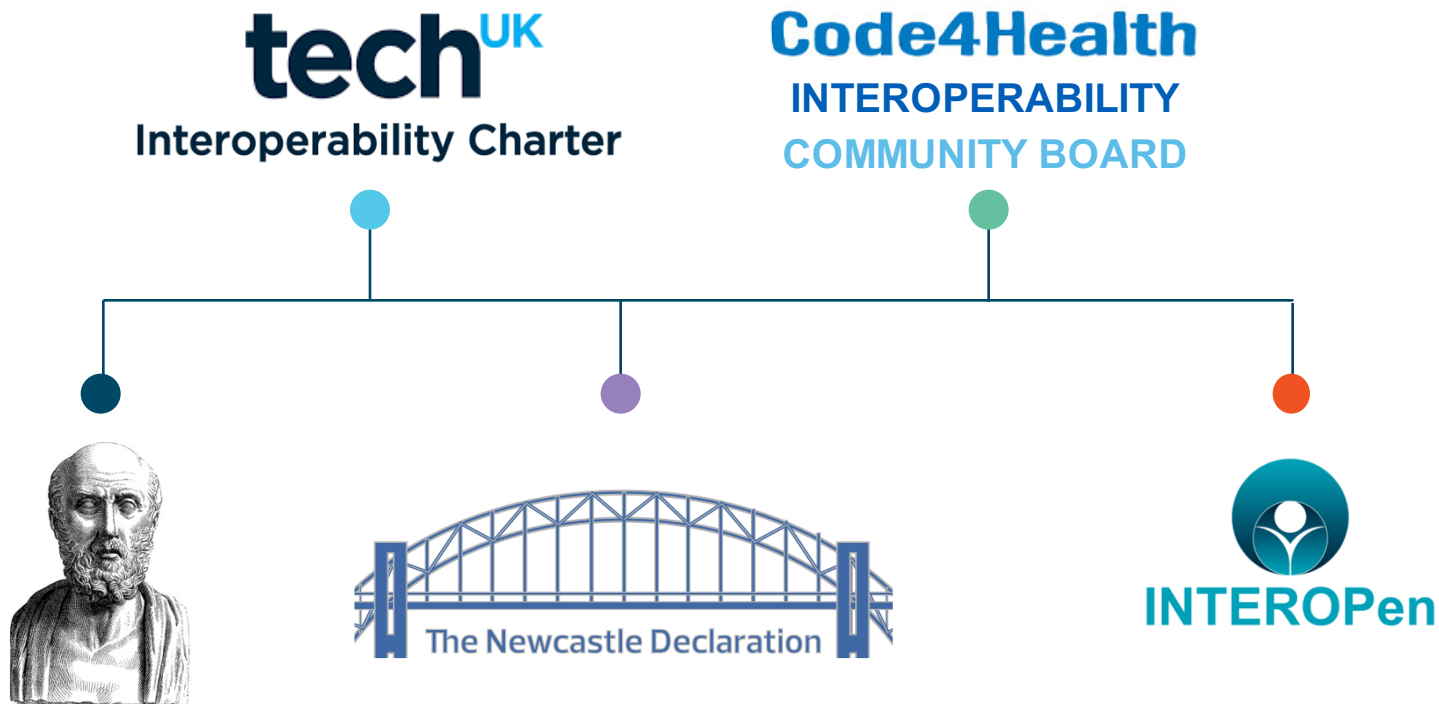
Developing Community FHIR Profiles

Accelerating the development of **open standards** for **interoperability** in the health and social care sector

Information and technology
for better health and care

presented by @DrAmirMehrkar (CCIO Orion Health)
Richard Kavanagh @RKavanagh (NHS Digital)

Interoperability timeline



The real cost of information silos

March 2015 - **NHS Litigation Authority** set aside

£26.1 billion

INTEROPen Community

techUK- Vendors

The technical elements of interoperability



Interoperability Charter

Newcastle Declaration – CCIOs

The flow of patient data across the care continuum



Delivery gap...2016
COALITION WILLING VENDORS



INTEROPen



A|D Vault

Advanced Health and Care

Allocate Software

Allscripts

Answer Digital

Atos

Blackpear

BT

Cambio+ Healthcare Systems

Capita Health Partners

Cerner

CGI

CharityLog

CommonTime

CSC

Docman

Egress

Emis Health

Elsevier

Endeavour Health

Enovacom

everyLIFE Technologies

Forcare

GPC

Graphnet Health

Health Intelligence

Health Linked

Healthcare Gateway

Health Fabric

HealthForge

Huawei Technologies (UK) Co

IMS MAXIMS

INPS

Intelesant

InterSystems

JAC Computer Services

Medelinked

Microsoft

Optum International

Orion Health

Patients Know Best

Quicksilver Systems Integration Solutions

Red Embedded Systems

Ripple

SCC

SiteKit

Solutions4Health

Stalis

Sunquest Information Systems

SystemC

Targett Business Technology

Tiani Spirit

TotalMobile

TPP

Trustmarque

Virgin Media Business

Wiggly-Amps

Your.MD

****JOIN suppliergroup@interopen.org****



INTEROPen is an OPEN collaboration of individuals, industry, standards organisations and health and care providers, who have agreed to work together to accelerate the development of open standards for interoperability in the health and social care sector.

Michael's Story in FHIR – structured data

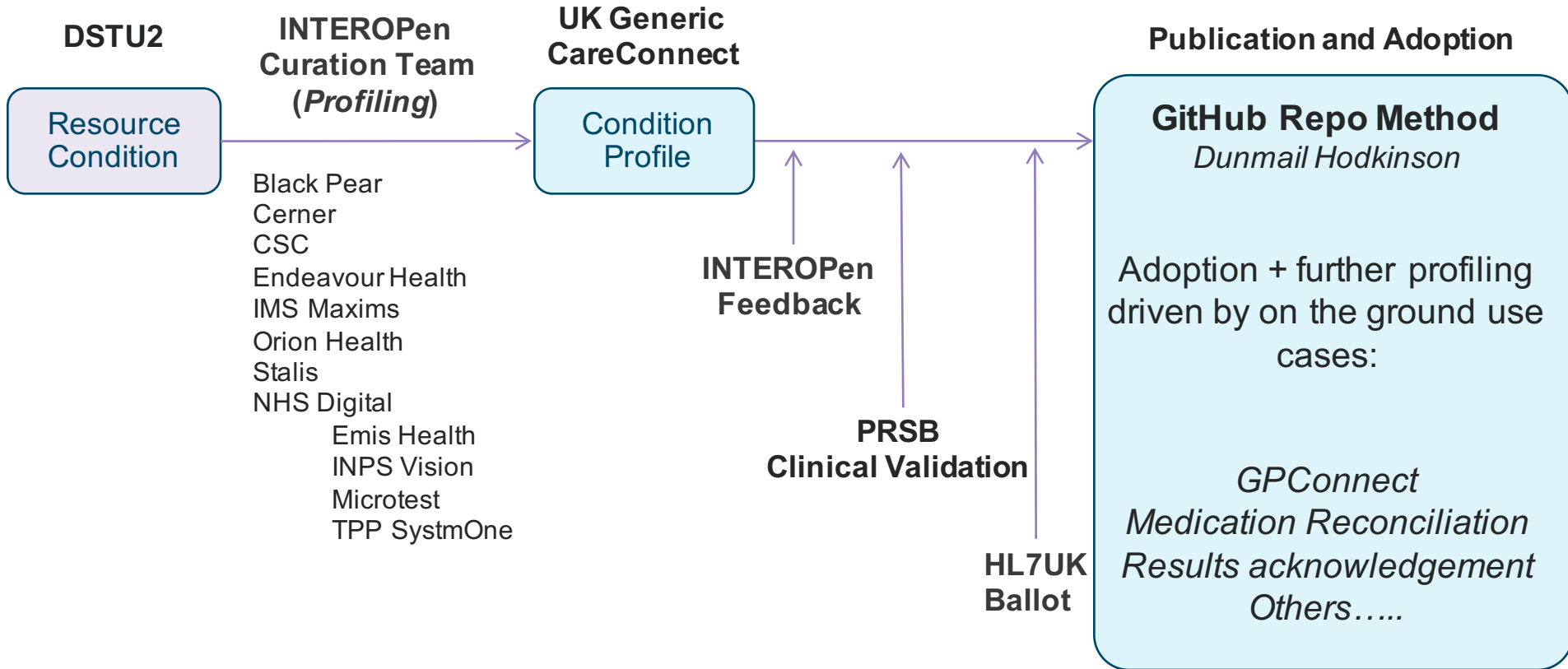
- 58 yr old
- Diabetes (insulin)
- Alcoholism
- Liver disease
- Anxiety



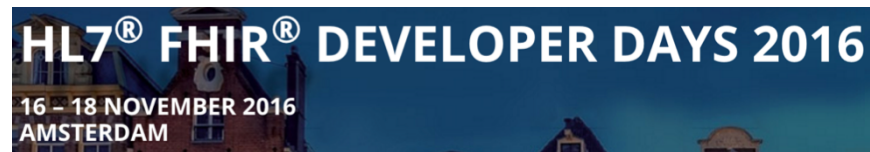
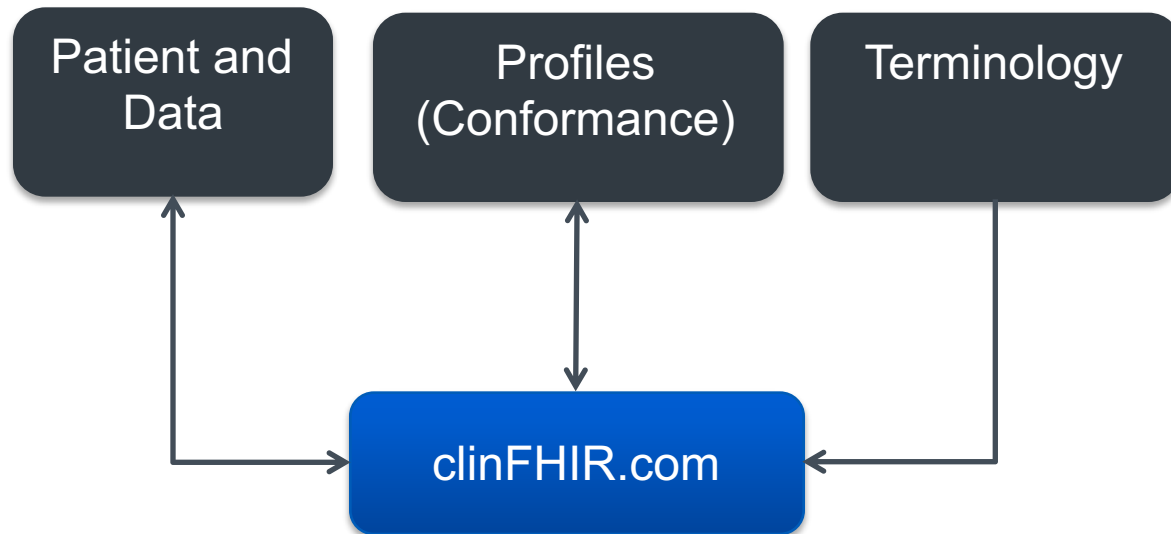
- ▶ Supports
- ▶ NHS New Models of Care (Five Year Forward View)
- ▶ NHS Personalised Health & Care Agenda

| Problems/Conditions |
|--------------------------|
| Medication (2) |
| Allergy |
| Immunisations |
| Procedures |
| Observations/Vital Signs |
| Encounters |
| Tasks and Notes |
| Appointments |
| ERS/Non ERS Referrals |

Evolving INTEROPen methodology



FHIR tooling example (for clinicians and techies)



<http://www.fhirdevdays.com/registration/>

[https://fhirblog.com/category/clinfhir/
@David_hay25](https://fhirblog.com/category/clinfhir/@David_hay25)

Models

New Model

Designer

Mind Map

Table

Mapping report

Json

TreeData

BloodPressure

draft

Borna_test

draft

myModel5

draft

nzAlliedHealth

draft

Zxzc

draft

BloodPressure

Data

Systolic

Diastolic

MAP

PulsePressure

Comment

State

Position

ConfoundingFactors

Exertion

SleepStatus

Tilt

Protocol

CuffSize

Location

Method

MAPFormula

DiastolicEndpoint

Device

Events

AnyEvent


24HrAverage

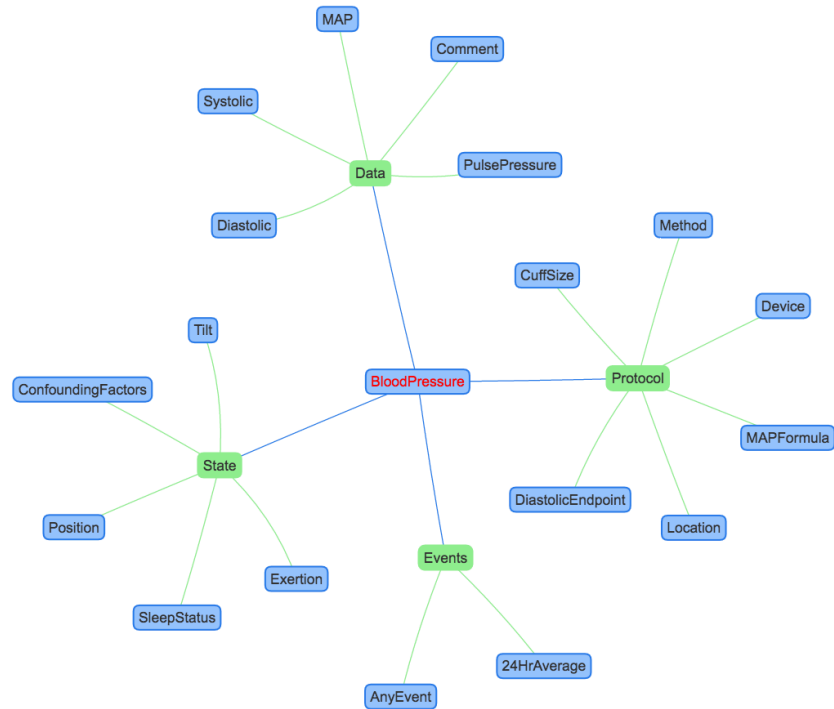
Model properties

[Edit](#)
[Summary](#)
[History](#)

| | |
|---------------|---|
| Model Name | BloodPressure |
| Model Title | BP model |
| Model Purpose | from openER archetype |
| Mapping | Single Observation with multiple extensions |

Element path *Systolic* properties

| | |
|---------------|---|
| Path | BloodPressure.Data.Systolic |
| Short | The systolic blood pressure |
| Description | The Systolic blood pressure |
| Comments | |
| Multiplicity | 0..1 |
| Datatypes |  Quantity |
| Mapping notes | Observation.component code = 8462-4 valueQuantity.unit=mmHg |
| Actions | ↑ ↓ Edit Element Add Element Remove Element |

BloodPressure*draft***Borna_test***draft***myModel5***draft***nzAlliedHealth***draft***Zxzc***draft*

Logical model element

Cancel

Save

Item name (no spaces)

Name of element

Short

Short description

Datatype

string



Multiplicity

0..1

1..1

0..*

1..*

Comments

Any comments on the use of this element

Description

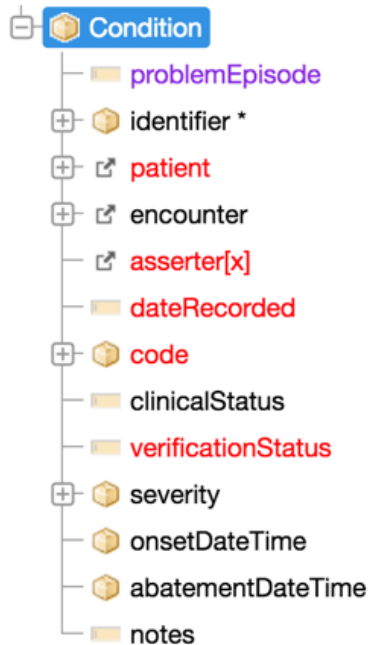
Description of element

Mapping

Describe FHIR mapping

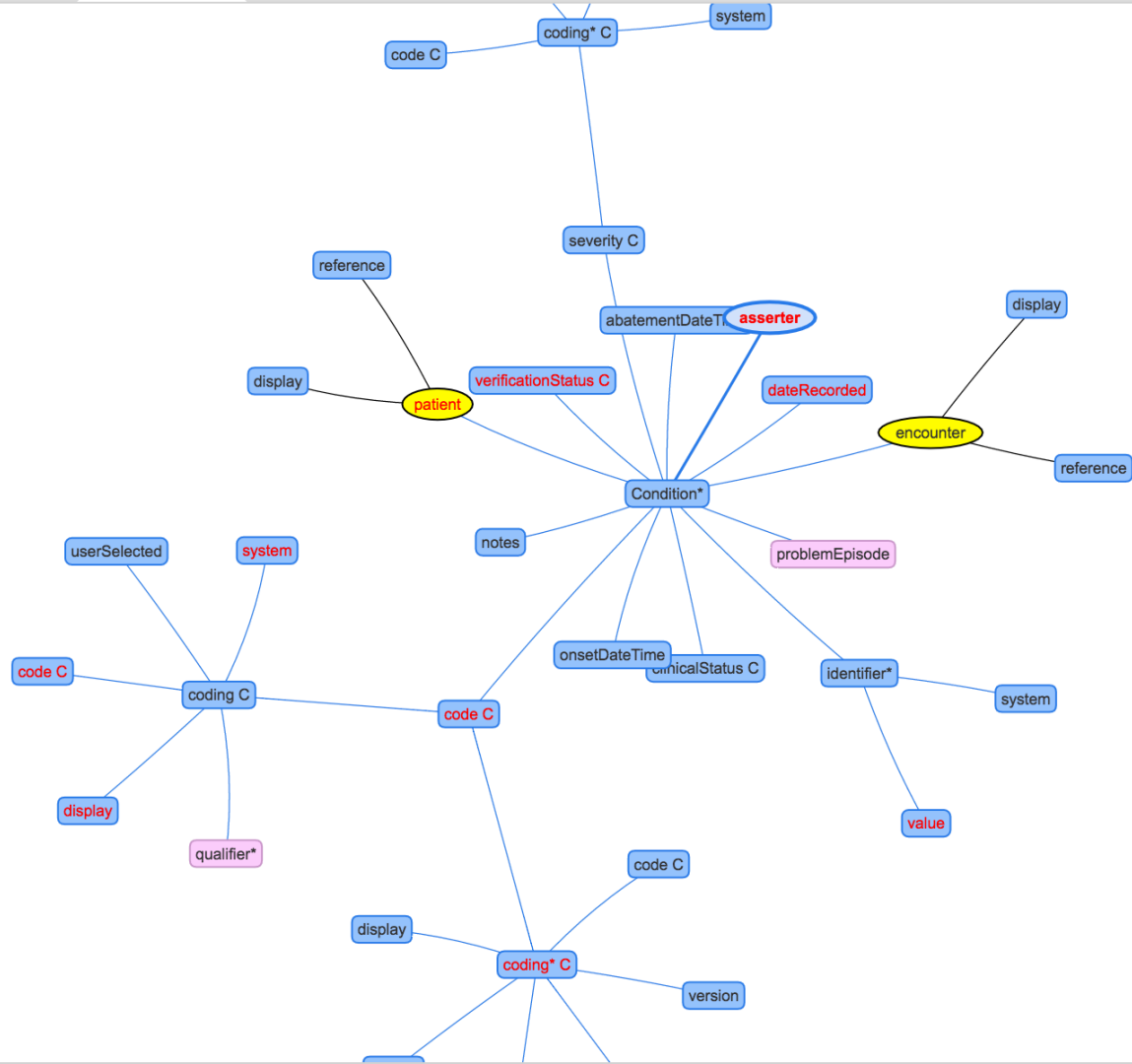
select ext

CareConnect-Condition-1



Differences from the base resource: <http://hl7.org/fhir/StructureDefinition/Condition>

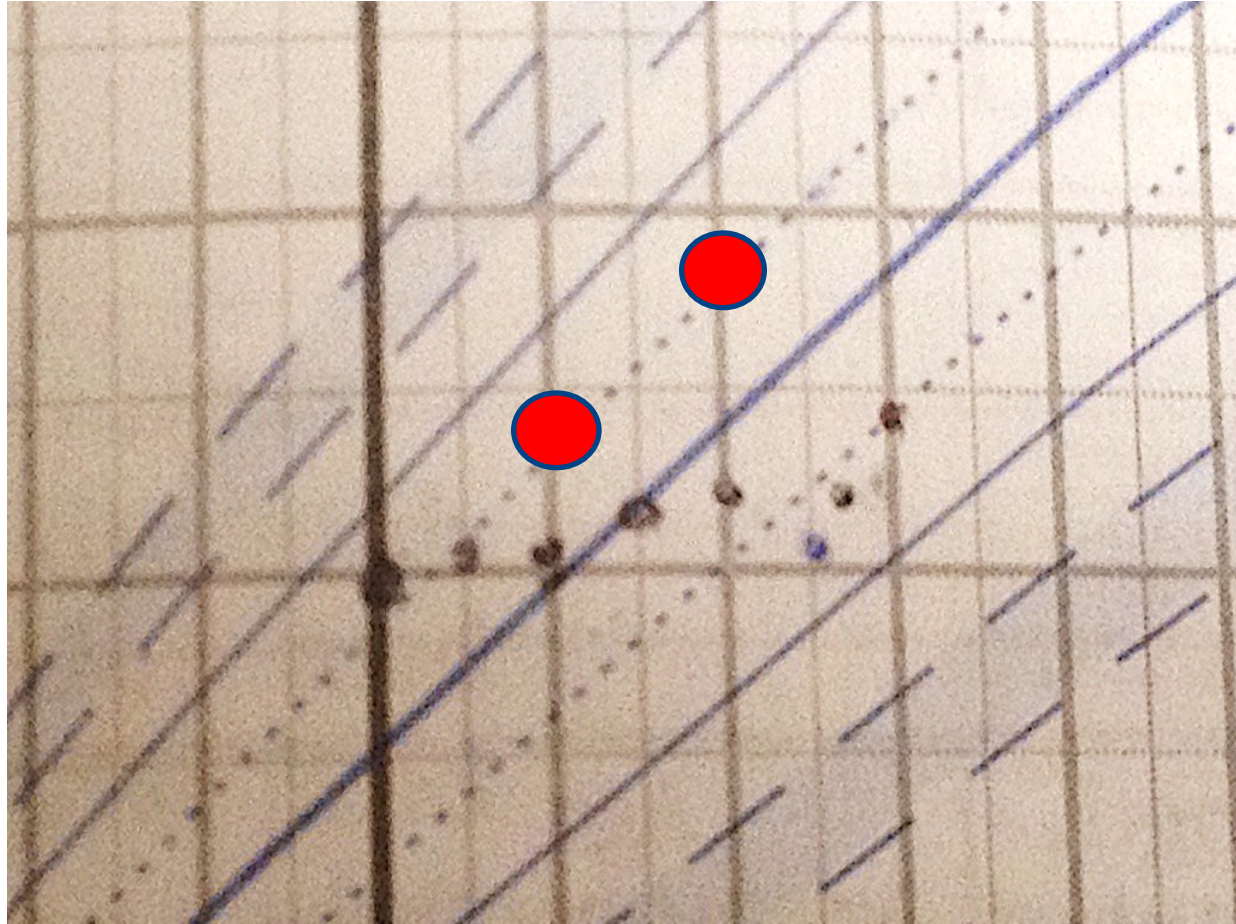
| | | |
|-----------|---------------------------------|---|
| extension | Condition.extension | The problem episode of which this condition is part of. The episodicity type (Review, F and the target problem episode. |
| extension | Condition.code.coding.extension | Used to qualify or indicate extra information about a coded value e.g. Laterality, Sever |
| extension | Condition.code.coding.extension | Used to qualify or indicate extra information about a coded value e.g. Laterality, Sever |
| removed | Condition.category | A category assigned to the condition. |
| removed | Condition.onset[x] | Estimated or actual date or date-time the condition began, in the opinion of the clinicia |
| removed | Condition.abatement[x] | The date or estimated date that the condition resolved or went into remission. This is c "remission" or "resolution" - Conditions are never really resolved, but they can abate. |
| removed | Condition.stage | Clinical stage or grade of a condition. May include formal severity assessments. |
| removed | Condition.evidence | Supporting Evidence / manifestations that are the basis on which this condition is sus |
| removed | Condition.bodySite | The anatomical location where this condition manifests itself. |



Where Next?

Structured Coded Data for Decision Support?

Digital Child Health eRedbook



FHIR Profiles under Development

The current set of profiles

| CareConnect Profiles |
|------------------------------|
| TRANCHE #1 |
| Medications (PRSB) |
| Allergies |
| Problems / Conditions (PRSB) |
| Procedures |
| Immunizations |
| Observations |
| Vital Signs |
| Encounter |
| |
| TRANCHE #2 |
| Patient |
| Organization |
| Location |
| Practitioner |
| |

The current set of profiles under development.
Represents the main building blocks of healthcare exchanges.

Aligns to :

- current projects underway in NHS Digital
- US DAF/Argonaut project
- INTEROPen member's products

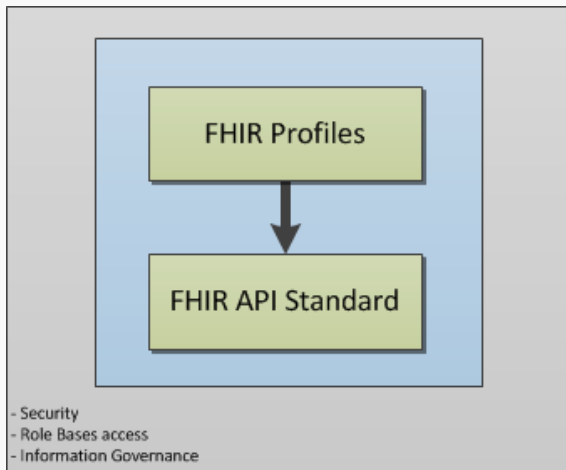
Clearly more profiles will be required, engage with INTEROPen to get them on the worklist.

Using Profiles in Interoperability Products

What do we mean by Profiles ?

- **Current work underway is to define the FHIR Profiles. Profiles provide the definition of information models to represent content.**
- **The profiles being developed are “generic” so that they can meet a wide set of use cases.**
- **The profiles can be considered to represent a “maximal” model of information.**
- **The profiles “constrain” the base resource model and extend to support known use cases.**
- **It is not expected that every product that uses the profiles will support the whole information model.**
- **Large portions of each profile are “optional” to provide products with the flexibility they need.**

How will APIs use Profiles ?



An API requires more than just the profiles

- Where as the profiles are “generic”, APIs tend to be specific in that they are created for a specified purpose.
- Profiles may need further constraints to meet requirements of the product.

It includes other definitions about the interface

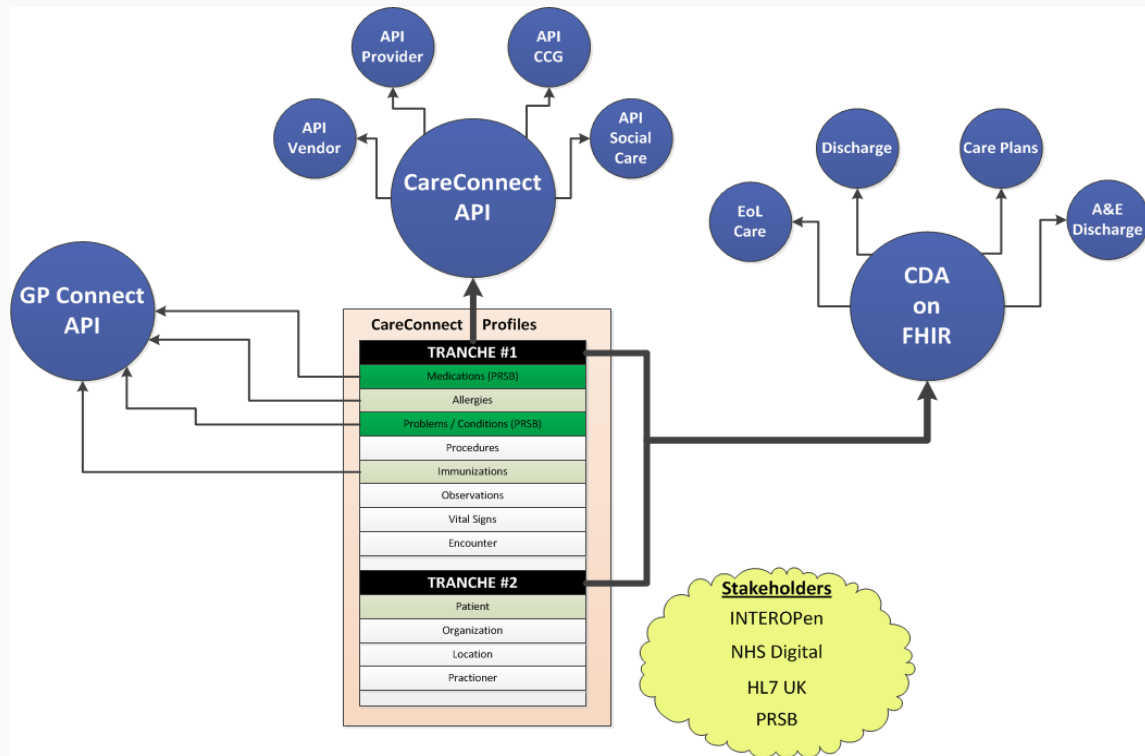
- Create, Read, Update, Delete of Resources
- Search paths for query mechanisms
- Definitions of operations (if required)
- Definition of error codes
- Definition of formats (XML, JSON)
- etc.

In addition other concerns outside the realm of FHIR are required.

- Security
- Permissions
- Information Governance
- etc.

Products using the FHIR profiles

NHS Digital's intended use



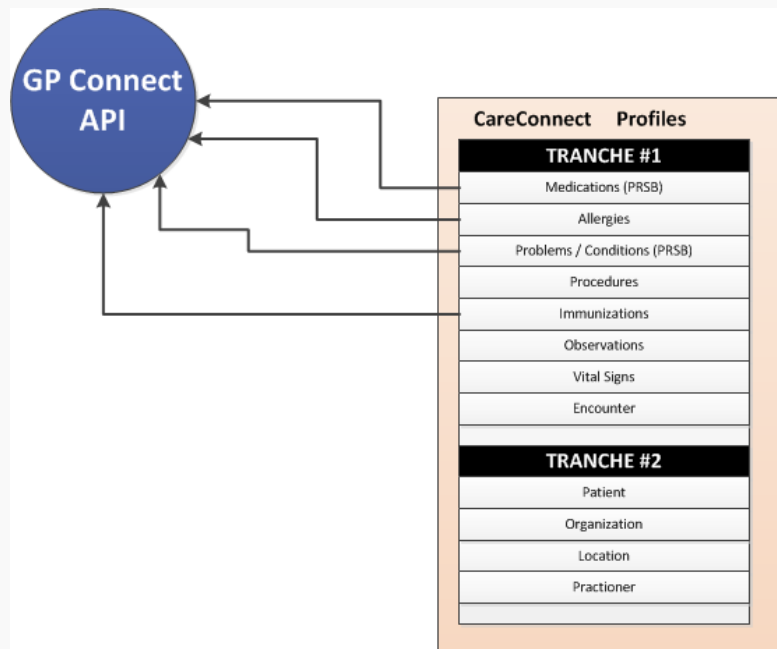
NHS Digital is already moving to a collaborative development approach.

“Community Authored” profiles are now part of the development approach with NHS Digital.

Current products include:

- GP Connect
- CDA on FHIR

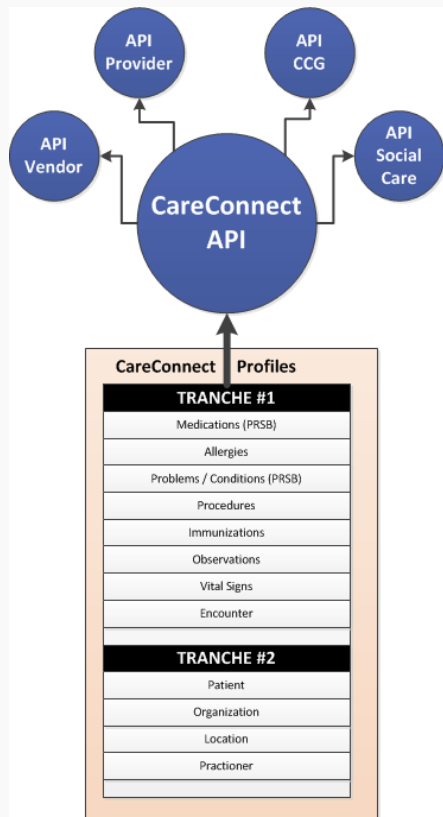
GP Connect's use of the profiles



GP Connect API development team working to incorporate all Tranche #1 coded structures, starting with:

- Medications
- Allergies
- Immunizations
- Problems/Conditions

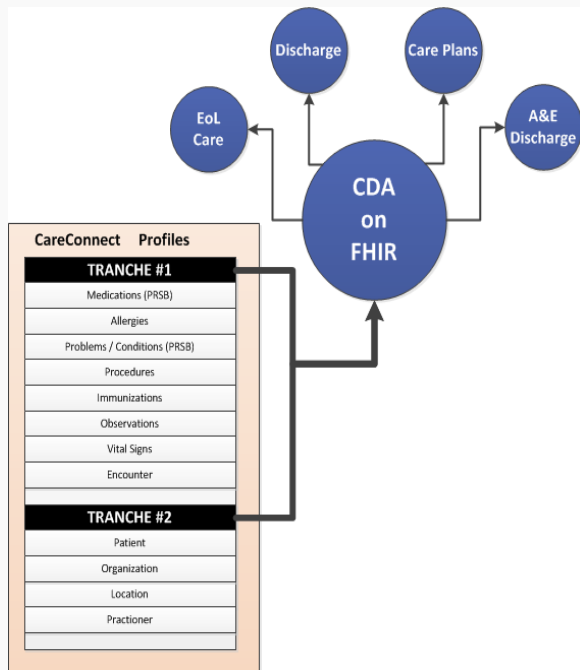
CareConnect's use of the profiles



CareConnect API development seeks to make use of all of the CareConnect FHIR profiles.

Other coded structures to follow in later phases of the API. Engage with INTEROPen if the profiles you require are not currently shown.

“CDA on FHIR” use of the profiles



- Exploratory work underway within NHS Digital to make use of the profiles within “FHIR Documents”
- Work exposed on GitHub/Developer’s network and will be discussed at a future Code4Health webinar.
- NHS England consultation underway which will inform the implementation path for “FHIR Documents”.

FHIR Documents are currently in development and are not for implementation within NHS Digital solutions.



INTEROPen



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