

201938

**The Unified Test List:
A SNOMED CT Refset for Reporting Laboratory Test
Results in the UK**

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What's covered in this presentation

- What is Pathology?
- What are the key Pathology related standards that are currently used in the UK and why do these need to change?
- What is NHS Digital's role?
- What is the Unified Test List?
- How was the Unified Test List developed?
- Next steps and further information.

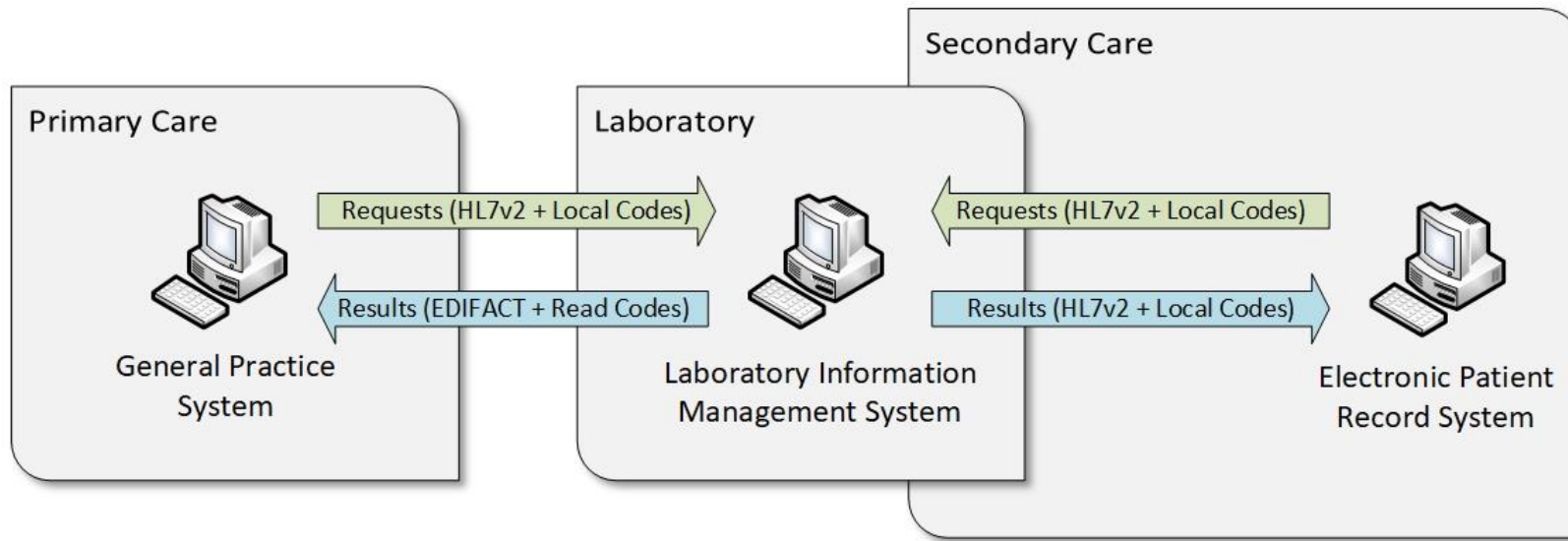


What is Pathology?

- Pathology is the study of disease.
- It is central to many aspects of patient care, including diagnostic testing, screening, disease prevention, treatment advice and the monitoring and management of conditions.
- Pathology encompasses a range of specialties, including:
 - Chemical Pathology (also known as Clinical Biochemistry)
 - Haematology
 - Microbiology
 - Histopathology
 - Virology
 - Immunology, and several others...
- The volume of use of pathology services is high. In the NHS (England and Wales):
 - around 95% of clinical pathways rely on patients having access to pathology services
 - pathology is involved in 70% of all diagnoses made
 - nearly 800 million tests are performed annually



Pathology – Current Information Flows and Standards (Simplified)



- The diagram provides a very simplified, generic view of the key pathology request and result information flows and standards that are currently used in the UK.
 - Other types of systems that are typically involved are not shown e.g. middleware, integration engines, order comms systems.
- Primary Care
 - Test requests are typically sent from the GP system via an Order Comms system (not shown) using HL7v2 format messages and local codes for the requested tests.
 - Test results are returned from the lab using a nationally defined messaging standard based on EDIFACT. Test names are coded using a nationally defined catalogue based on Read codes.
 - Secondary Care
 - Test requests and results are sent using HLv2 format messages. These vary depending on system supplier. A variety of locally defined codes are used for test names.

Pathology – Drivers For Change

Strategic Drivers

- Recently published NHS vision and strategy documents such as the [NHS Long Term Plan](#) and [The Future of Healthcare](#) state the need for clinicians, patients and carers to have access to information using clear and consistent standards.
- Interoperability, enabled by open data standards, is a key building block to help achieve that vision.
- Within pathology, there is an increasing need to standardise the ways in which test requests and test results are defined and shared between health care professionals and patients.
- This will enable a range of benefits, including:
 - improved clinical decision making and patient safety due to the ability to unambiguously communicate and interpret pathology test results
 - the ability to establish managed networks of pathology laboratories
 - opportunities for using the data to support secondary uses such as analytics
 - the ability for commissioning organisations to consistently compare and manage costs

Pathology – Drivers For Change (continued)

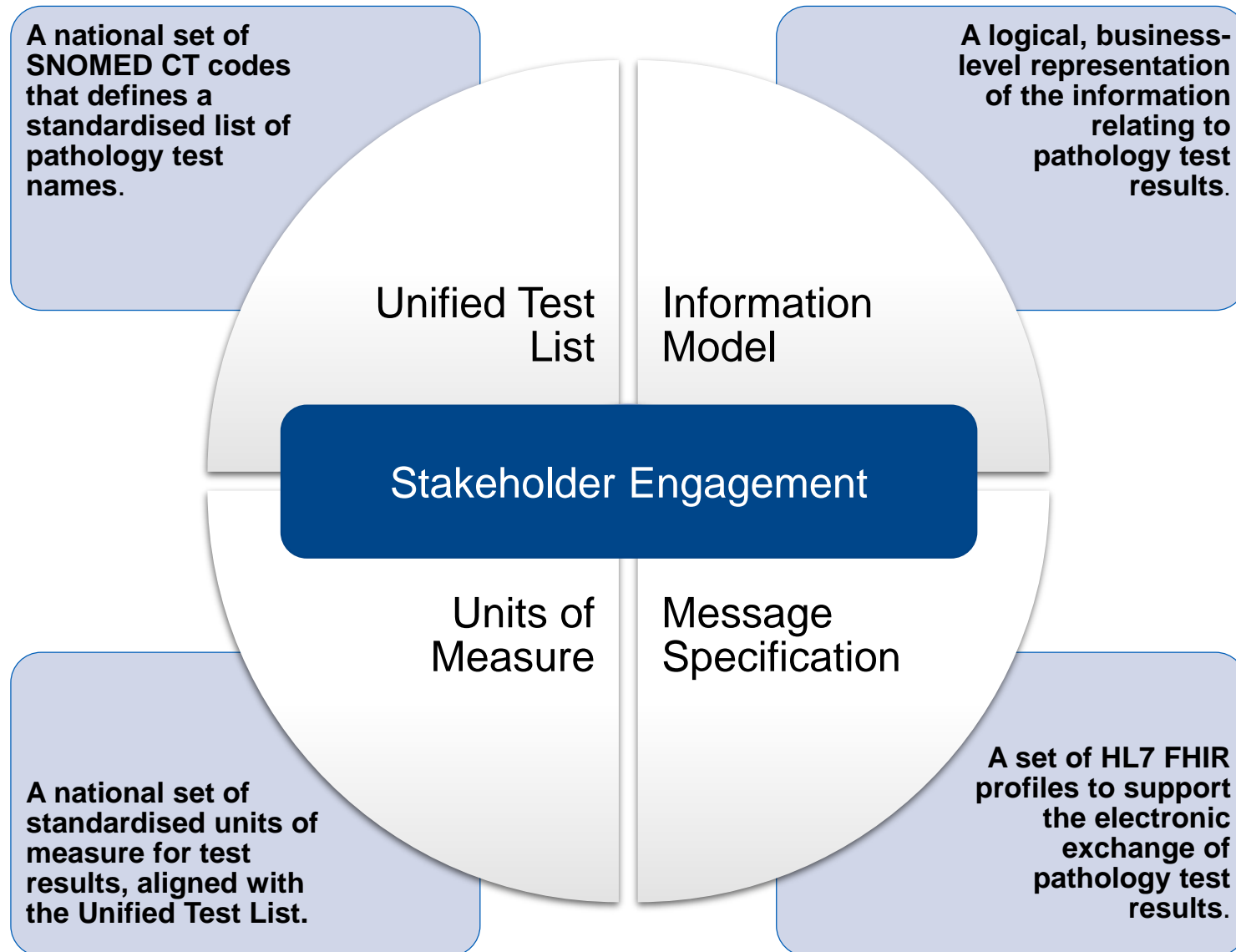
Retirement of Read Codes

- Test results sent from labs to primary care currently use a coding scheme for test names based on [Read codes](#) rather than SNOMED CT. This is known as the PBCL (Pathology Bounded Code List).
e.g. 44h6 – Plasma sodium level
- Read codes are in the process of being retired therefore there is a need to move to a new SNOMED CT based coding scheme for pathology tests.
e.g. 1107861000000100 – Sodium substance concentration in plasma
- The new SNOMED CT based pathology test coding scheme is being developed by NHS Digital and is called the Unified Test List.

Legacy Messaging Standard

- The current lab to primary care interface for sending pathology test reports uses a legacy messaging standard based on EDIFACT. This uses the PBCL (based on Read codes) for coding test names.

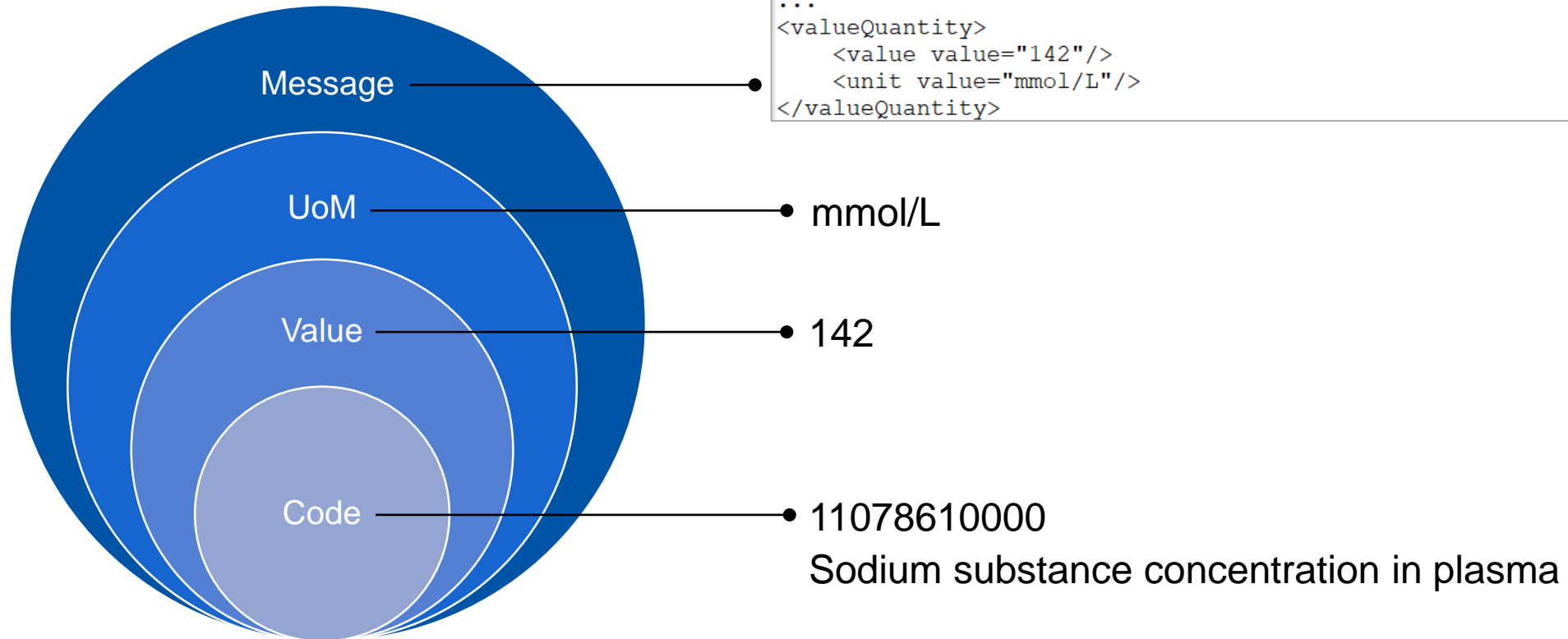
NHS Digital – Inter-related Pathology Workstreams



NHS Digital – What are we trying to create?

Transfer clinical statement  Sodium substance concentration in plasma 142 mmol/L

```
<code>
  <coding>
    <system value="http://snomed.info/sct"/>
    <code value="1107861000000100"/>
    <display value="Sodium substance concentration in plasma"/>
  </coding>
</code>
...
<valueQuantity>
  <value value="142"/>
  <unit value="mmol/L"/>
</valueQuantity>
```



Unified Test List – What Is It?

- Unified Test List (UTL) – a catalogue of SNOMED CT coded laboratory test result terms.
- Based on the SNOMED ‘observable entity’ type.
- Naming convention for terms/descriptions is based on ‘patterns’.
- Core pattern is the triad of **Property-OF-Thing-IN-Specimen**.
- An extension to this pattern includes **Method**.
- This pattern forms the core of proposed UK modelling and associated Editorial Principles
- Other patterns will be identified and applied as work on the UTL progresses.
- Examples:

Creatinine substance concentration in **serum**

(substance + property + specimen)

Creatinine substance concentration in **serum by enzymatic method**

(substance + property + specimen + method)

- Currently published in SNOMED CT RF2 format and also in human-readable (HTML) format to aid stakeholder review.
- Latest release (published October 2019) contains approximately 1600 entries.
- Designed for use with the Information Model and HL7 FHIR message specification

Inter-related Work – SNOMED Model + Message Model (FHIR)

Test Name	SNOMED Attribute Model (‘observable entity’ type)					Message Model (FHIR) (relative to SNOMED model)			
SNOMED Term	COMPONENT <i>substance etc. being measured</i>	PROPERTY <i>constrains UoM Field</i>	DIRECT SITE <i>specimen</i>	TECHNIQUE <i>method</i>	RELATIVE TO <i>second component of ratio, % etc.</i>	UoM	Time	Patient/ Specimen Precondition	Reference Range
<p style="text-align: center;">REPORTED RESULT VALUE FROM TEST: <i>n</i></p>									

Creatinine substance concentration in serum *by enzymatic method*

Message Specification – FHIR Profile Linkages

The following provides a simplified, schematic view of the key pathology related FHIR profiles and elements, and the relationships between them.

ProcedureRequest (Test Request Summary)	
id	d9df1431-22ac-462a-946a-f195f6c639af
status	active
intent	order
code.coding.code	63476009
code.coding.display	Prostate specific antigen measurement (procedure)

DiagnosticReport (Test Report)	
id	efae5859-28df-4e7d-be91-6df56d8215e4
basedOn	d9df1431-22ac-462a-946a-f195f6c639af
status	final
code.coding.code	721981007
code.coding.display	Diagnostic studies report
issued	2019-03-03T12:00:00+00:00
specimen	756a8361-79ce-4561-afcb-a91fe19df123
result	dacb177a-9501-4dcc-8b22-b941791ae0db

Specimen (Specimen)	
id	756a8361-79ce-4561-afcb-a91fe19df123
status	available
type.coding.code	53130003
type.coding.display	Venous blood (substance)
receivedTime	2019-01-29T15:00:00+00:00
collection.collected	2017-11-01T11:00:00+00:00

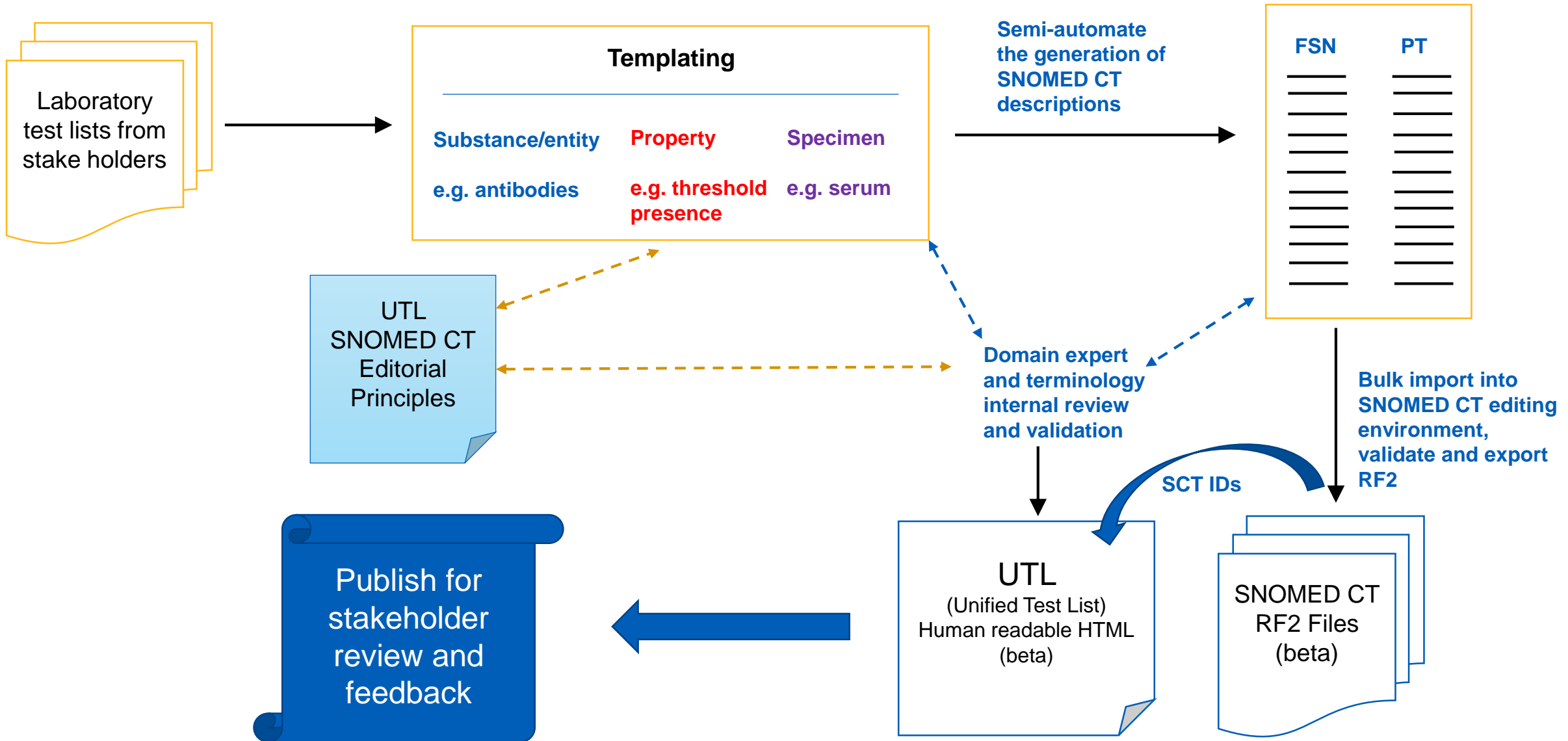
Observation (Single Test Result)	
id	dacb177a-9501-4dcc-8b22-b941791ae0db
status	final
code.coding.code	1030791000000100
code.coding.display	Prostate specific antigen level (observable entity)
effectiveDateTime	2017-11-01T15:00:00+00:00
valueQuantity.value	5.9
valueQuantity.unit	ug/L
referenceRange.low	0
referenceRange.high	4
specimen	756a8361-79ce-4561-afcb-a91fe19df123

To aid clarity, the FHIR profiles for Patient, Practitioners and Organizations have not been shown. Similarly, not all of the required data elements have been shown. The arrows indicate the links between the FHIR profiles, using the local ids assigned to each resource instance. SNOMED ids are highlighted in yellow.

Unified Test List – Development Approach

- Existing pathology test lists used as input:
 - national test catalogues e.g. PBCL (Pathology Bounded Code List) – based on Read codes
 - hospital Trusts – based on local codes
- Design patterns identified and applied.
- Human readable list used for initial authoring and clinical review.
- Bulk import facility to SNOMED CT authoring and validation environment, and export as SNOMED CT RF2.

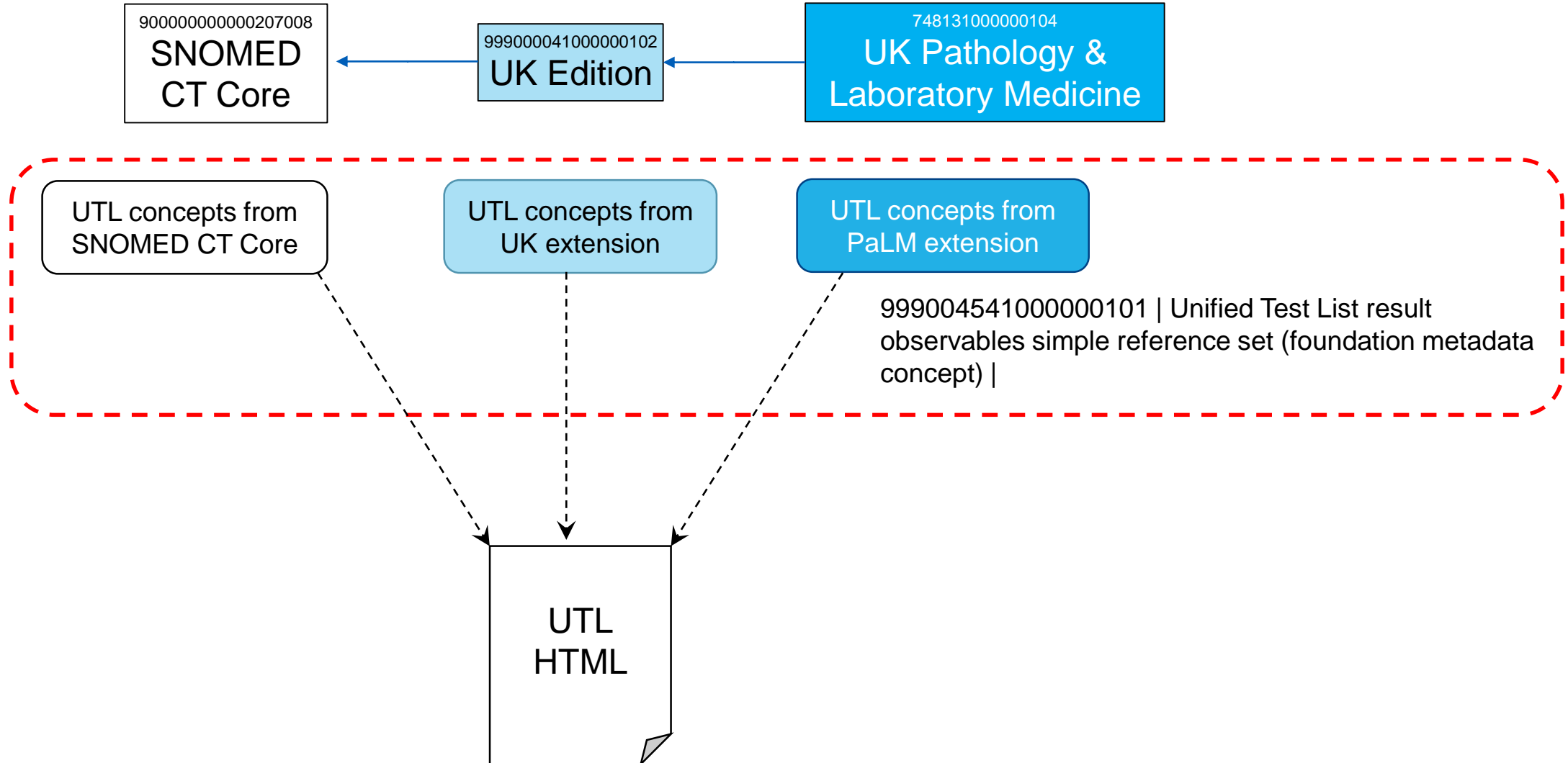
Unified Test List – Development Approach



SNOMED CT Refset and PaLM extension module

- First release of UTL in October 2018 - SNOMED CT concepts were in UK Clinical edition so produced a reference set of only the UTL SNOMED members
- Pathology and laboratory medicine content creation process re-engineered to templating and semi-automation
 - high volumes of content from stakeholders
 - Identifiable patterns and cognitive modelling
- Decoupled from the UK clinical extension module (RF2 **production release**) - biannual
- Creation of **PaLM (Pathology and Laboratory Medicine)** extension module
 - Add lists of templated content and export RF2 **beta releases** independently
 - UTL and PaLM RF2 extension are in development status in the NHS Digital product life cycle - *new terminology development process*

SNOMED CT Refset and PaLM extension module



Next Steps and Further Information

Next Steps

- Formalise design and editorial guidance.
- Identify and apply further design patterns.
- 1600 added so far - blood sciences concepts (principally chemical pathology and haematology with a small sample of virology and immunology and other domains)
- Support additional pathology specialities e.g. microbiology, immunology, histopathology, virology
- Scale up the build/review process – explore use of SNOMED International’s templating tool and Release Validation Framework.
- Target of 3000-5000 UTL entries by April 2020.
- Undertake First of Type testing of pathology FHIR message specification, in conjunction with adoption of the UTL.

Further Information

- Unified Test List:
<https://hscic.kahootz.com/connect.ti/PathologyandDiagnostics/view?objectID=13047024>
- NHS Digital Pathology Service mailbox:
pathologyanddiagnostics@nhs.net



Any Questions?

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