**NHS Digital**

# The Unified Test List (UTL)

The National SNOMED CT Coded Reference Catalogue for Clinical Laboratory Test Results Reporting

Product Overview for UTL v0.8.0

**Product Status: Draft for Trial Use**

# Glossary of Terms

| Term / Abbreviation | What it stands for |
|---|---|
| ~~SNOMED CT~~ | <ul><li>Is the most comprehensive, multilingual clinical healthcare terminology in the world</li><li>Is a resource with comprehensive, scientifically validated clinical content</li><li>Enables consistent, processable representation of clinical content in electronic health records</li><li>Is mapped to other international standards</li><li>Is already used in more than fifty countries</li></ul> |
| PBCL | The Pathology Bounded Code List is a list of 'Read codes' and is the basis for transmitting many patient laboratory results to GP practices. |
| NLMC | A national catalogue of pathology tests designed to fully replace the PBCL and initially covering requestable tests only. It is commonly used as the foundation for that purpose. The original complementing result coding part of the NLMC has been taken up as the UTL, and UTL is now being extended to include requestable |
| FHIR | FHIR (Fast Healthcare Interoperability Resources) is a standards framework created by HL7. It is a platform specification that, in this context, provides the technical message specification and structure in the healthcare information ecosystem to carry the SNOMED lab test result and all the associated data safely from one point to another |

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# Contents

# 1. Overview

## 1.1. Scope

This document describes the Unified Test List (UTL) which is a list of SNOMED coded laboratory test result terms published by NHS Digital.

This document assumes a basic familiarity with SNOMED CT at the level of distinguishing the hierarchies of procedures, findings and observable entities and the modelled requirements embodied in SNOMED representations but for further reading on the wider terminology you can refer initially to the UK SNOMED CT website. There is also background documentation including a SNOMED CT starter guide (PDF) on the SNOMED International web site.

## 1.2. Audience

The UTL is directed particularly at clinicians and scientists interested in validating and enhancing laboratory test content, whether directly engaged in laboratory medicine or otherwise, laboratory information managers, LIMS middleware and primary/secondary care suppliers/vendors, laboratory science quality organisations, commissioners and public health leads and those otherwise involved in current PBCL/NLMC deployment and oversight.

Nevertheless, the product will be of interest to a much wider constituency too broad to list here.

## 1.3. Context

The UTL is a constrained set of SNOMED coded terms designed to operate either directly in an electronic patient record, in a FHIR message relating to that patient by carrying a test result or as a central reference list to support the interoperability of local code sets in clinical laboratories and their laboratory information systems (LIMS). The UTL is designed for use with the HL7 message specification FHIR (see Glossary).

The UTL is published by NHS Digital who also facilitate governance oversight at editorial level working closely with the UK Edition Committee for SNOMED CT. The UTL is designed to be the standard reference terminology product for all reporting of laboratory tests in the UK. For result reportables, it is the successor to the PBCL and NLMC across the NHS estate.

**PBCL:** The PBCL is a restricted list of codes originally created in 1997 to support the Pathology Messaging Implementation Project (PMIP), an EDIFACT messaging service that now carries hundreds of millions of reports per year from all NHS Labs to GPs in England and Wales. The list was published biannually until the final release in April 2018. By October 2015 it comprised a single table listing 3870 laboratory tests that are commonly used as reportable items in a primary care setting. The PBCL code list is also used extensively within 3rd party eRequesting middleware services (e.g. Sunquest ICE).

**NLMC:** The National Laboratory Medicine Catalogue (NLMC) is a national catalogue of pathology tests that initially focused on standardised content related to test requesting with the intention of building result content alongside. The catalogue had substantial clinical input and quality assurance of content. However, with the NHS focus on moving reporting on from the (Read coded) PBCL to a standardised SNOMED list, the scope for reporting codes within NLMC was not exploited and its subsequent significant uptake remained concentrated on the 'orderables' side of the lab model. The UTL takes on the reporting side of the model originally set out for NLMC. It rests on that development and editorial work.

Laboratory processes can be usefully characterised as consisting of 'orderables', 'performables' and 'reportables' i.e. requests for analysis, the activities done in the lab in response and the results of that activity to be transmitted back to the requester of the test. The SNOMED coding requirements are different in each of these, but much is codable by breaking it down in this way and applying SNOMED semantics. The aim is to create a results list that is usable by all sectors of the system including a migration from old 'Read code' based PBCL to SNOMED coding for Primary Care reporting. There is also potential for single results codes to be used in requests (as a blank 'tell me the answer to this question' format) and for 'lab-to-lab' communications when combined with a complementary list of battery/profile/panel types.

The content expansion continues to focus on blood sciences (i.e. principally chemical pathology/biochemistry and haematology) with a growing proportion of immunology and cell marker (CD) content. Current expansion work includes new microbiology and autoantibody content.

For those familiar with Read and SNOMED coding, the SNOMED terms will seem more specific than those in the PBCL or elsewhere but this conforms to a well-defined SNOMED structure with the key objective of tightly defining and constraining what sort of result *value* can be appended to a result *code*, in what format it is allowed to appear and what *unit of measurement* (if any) it is permitted to have assigned. A major difficulty in the past has been the potential for variation in these constraints across many systems making results comparison difficult and causing the sharing of results outside very tightly defined pathways to be done only with great caution in case of loss or de-structuring of data and hence misinterpretation. Formal SNOMED terming does not in any way preclude or prevent intermediate or local representations of UTL terms.

It should be noted that the coded terms do not contain units of measurement or reference ranges. Please refer to the editorial principles for more detail (see Documentation section).

Alongside the UTL spreadsheet is a simplified model diagram of how SNOMED constructs a detailed machine-readable definition of the test result term so that this can be used to determine FHIR message profile constraints. (For review purposes, it may be useful to understand the basics of this.)

## 1.4. READ Withdrawal and Timetable for Transition to SNOMED CT

Information Standard Notices 1552 and 1553 confirm the schedule for deprecation (phasing out and retirement) of the already formally deprecated standards Read v2 and CTV3.

NHS Improvement have directed that: All systems purchased and deployed into the NHS going forward must meet the following standards for requesting, reporting and communicating diagnostic test results:

1) SNOMED CT

2) FHIR (Fast Healthcare Interoperability Resources) message standard.

What this means is that by April 2020 SNOMED coded laboratory result terms will have to be used and that these must be understandable between organisations. A national standard for reports is needed and the UTL is in development to meet this requirement in conjunction with a corresponding FHIR message.

# 2.  Background

Clinical laboratory reporting of results has been divided along hospital and primary care lines  with direct reporting within hospitals, but not necessarily integrated with patient record   systems, and EDIFACT messages with PBCL Read codes to GPs. GP systems are largely  migrated to SNOMED coding but lab reporting is still based on the old PBCL product. The  expectations on primary care migration to SNOMED CT and the implications this had for the   PBCL were shared with stakeholders including GP and laboratory system suppliers, Joint GP  IT Committee, Primary Care Pathology National Advisory Group/ Primary Care Pathology  National User Group. Options for the immediate future of the PBCL were considered        and led to the conclusion that the optimal management of PBCL reporting items should      be as 'observable entity' semantic types in SNOMED CT, not as 'procedure' codes as  mapped for NLMC purposes.

NHS Digital revised the PBCL maps from Read to SNOMED in 2017/18 from NLMC mapped  procedure codes to observable entities. There are equivalent code maps in SNOMED for  almost all PBCL members but the SNOMED codes perpetuate the inadequacies of the old  Read codes in lacking specificity in defining units of measurement. In continuation of NLMC   development work, NHSD undertook a review of the PBCL and NLMC and also reviewed  international laboratory result representations before taking the decision to encode the UTL   as a SNOMED product and continuing the expansion and definition of the observable entity  content in SNOMED.

# 3.  Product Status and Expected Use

This product is published as 'Draft for Trial Use' status.

Reviewers of this product should note the following extract from the document 'The Lifecycle  of IReS Terminology Products' available here:

**Release Status:** An IReS Terminology product ('product') shall exist in one of the following  statuses:

1. In Development

2. Technology Preview

3. Draft for Trial Use

4. Supported Product

5. Deprecated

6. Retired


The files are being published here for clinical review and for evaluation for LIMS use etc.  They are not yet approved for use in live systems. NHS Digital does not currently support  loading the file as a replacement for the PBCL labsetvxxxx.txt or any other laboratory test  artefact.

# 4.  UTL Release History

## 4.1.  Earlier Releases

The first release of the UTL (version 0.13) was published in February 2019 and formally  released in

June 2019 in alignment with the main biannual 1/10/2019 SNOMED UK Edition.  The list of 350 SNOMED coded terms was a proposed basis of the UTL, focused initially on 'blood sciences content (i.e. principally chemical pathology and haematology with a small  sample of virology and immunology and other domains) that is eventually expected to   contain perhaps 5000 codes or more. It was a starter set derived from a combination of  some 'top 100' blood sciences tests and example specialist result requirements at a more   granular level (e.g. PTH). The aim in getting both generalist and specialist dimensions  covered was to provide a list for open consultation that can show how it would work in both  contexts.

The second release (v0.2) continued in line with the first, significantly expanding the blood  sciences content as a priority previously set out. Development of further content continued  with most welcome contributions of local lists from Epsom & St Helier (SW London), York &   Hull and from the Greater Manchester Partnership, along with a very valuable drill-down into   Renal Dataset requirements from the Renal Association leads which led to development of   the model for capturing specialist test methods and then higher method specificity   requirements. Their support and commitment is gratefully acknowledged here.

The development of blood sciences content has continued along with the addition of allergen  specific IgE coding through versions v0.3.0 and 0.3.1 in October 2019.

UTL 0.4.0 was a minor interim release with a modest increase in new content of  over 130 rows including the following: CD counts, calculi (stones), acylcarnitines by blood spot,  complement coagulation factors, and haemoglobin variants.

UTL 0.5.0 included microbiology content to represent a sample of organism nucleic acid tests, and organism susceptibility tests.

UTL 0.6.0 included initial batches of PBCL replacement and some outstanding blood science gaps from local lists including allergen components and autoantibodies.

UTL0.7.0 included the bulk of outstanding PBCL report codes in Chemical pathology, Endocrinology, Toxicology, Andrology, Haematology, Immunology, and Microbiology

## 4.2.  UTL v0.8.0 (this release)

This release has a total of 3985 active SNOMED CT concepts and includes updates to the following domains:
- Chemical pathology
- Haematology
- Microbiology

The human readable release is provided in three parts:
1. PBCL (Pathology Bounded Code List) request codes and Covid-19 request codes
    a. Panels/groups and high-volume single test requests – 225 concepts
    b. Screening test requests – 131 concepts

2. Outstanding PBCL reportable codes and Covid-19 reportable codes (included in the main Report code set file) – 133 concepts

3. Concepts representing the "**qualitative result of presence**" including Covid-19 codes – 447 concepts (including updates to codes published in 0.7.0)

The concepts representing the "**qualitative interpretation of presence**" was flagged as an area that may be ambiguous in use.

To establish a consensus from users and stakeholders we have published this terminology pattern as **Qualitative Result** alongside the main content but separate from the core terminology recorded in the machine-readable form, to solicit further beta feedback on the preferred pattern for these concepts.

The columns for the attributes including substance, property and specimen are included in the release files purely for information. They will ultimately be used to formally classify the SNOMED content using the observable entity concept model, where the attributes and corresponding values will be used to create the SNOMED CT machine readable description logic definitions.

# 5. Description of Release Files

The UTL is currently published in three locations in different formats while drafting the content is underway. This choice of formats facilitates exposure to review by all relevant stakeholders, whether those needing a simple spreadsheet of terms or a technical file specification for deployment in systems. This will be standardised as the product reaches Tech Preview and Final product TRUD Pack

1. A SNOMED reference set of a small subset of content originally published in the UK Clinical Edition is only accessible within the main UK Edition release of SNOMED CT on TRUD (Note: not a stand-alone file)

2. Human-readable files in HTML, and delimited file (TSV) equivalents are downloadable from the Pathology & Diagnostics Information Standards Collaboration Space.

3. A machine-readable file in a Release on TRUD. Note that a user account is required to access licensed content on TRUD.

While UTL is in a state of rapid development not every release will be published in all forms and locations. The human-readable release on the Pathology collaboration space will always be the most up to date version.

## 5.1. TRUD Pack Contents

The pack currently contains:

1. The UTL in SNOMED CT RF2 (Release Format 2)
2. A product Overview document (this file)

The pack is formatted as a zip archive and can be accessed by expanding the archive in a Zip file manager (Zip management is built into most modern operating systems)

The RF2 format contains multiple CSV (tab delimited) files. Because of known issues when opening CSV content in spreadsheet tools such as Microsoft Excel, users should take care to ensure that all CSV fields are interpreted as text to avoid problems, notably that some SNOMED IDs may be mis-read as numbers and possibly displayed incorrectly.

The pack contents for this draft product may change over time as per its 'In Development' status.

For more details of the SNOMED model as applied to this observable entity content in the UTL please refer to the editorial principles available as a PDF download on the Delen pages maintained by NHS

Digital.

The UTL can refer to SNOMED content from four modules: UK Clinical, International Core  and Production (Live) and Pre-Release modules for Pathology & Laboratory Medicine (PaLM) content.  The draft review file contains the full UTL  membership.   The TRUD file contains concepts in the International core module, UK clinical module and the PaLM module.  Below is a representation of the module dependency relationships.

Figure 1.
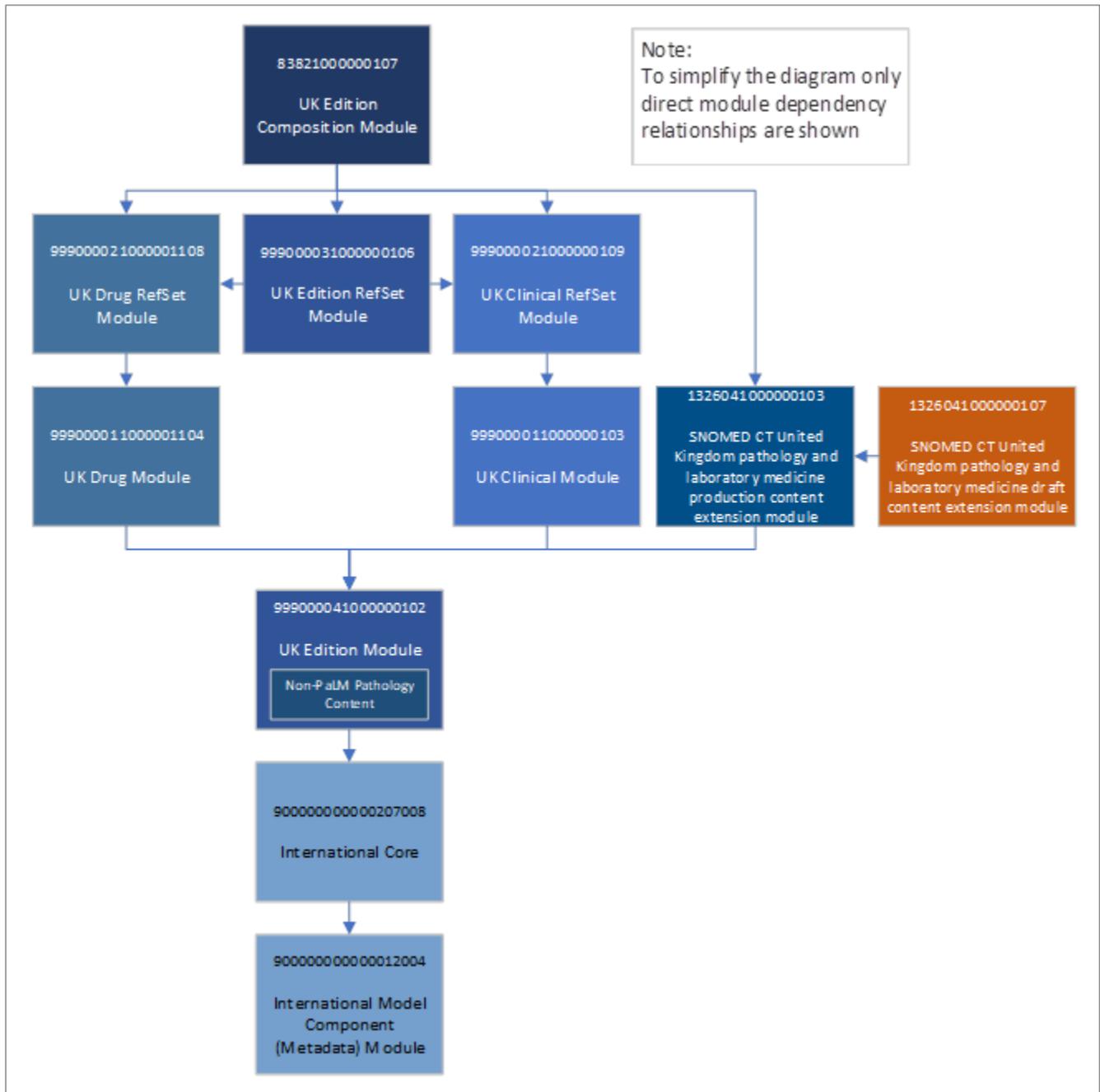


Until content is fully modelled, all new UTL reportable concepts added to the PaLM module have as a supertype the top-level international code *363787002 | Observable entity (observable entity)*. UTL requestable concepts are based on the supertype *71388002 | Procedure (procedure)*. At present, all content is also therefore 'primitive', the only relationships to other concepts being to the supertype/parent.

The module structure of UK Pathology content has been changed for the UTL v0.8.0 release to allow PaLM content to be integrated into the overall UK Edition of SNOMED CT, and also to allow PreRelease (Beta test/review) content to be published in parallel with Live production-ready content. The key changes are-

1. Approximately 650 UTL SNOMED CT concepts referred to in the UTL human readable subset reside in the *999000041000000102 | SNOMED CT United Kingdom Edition module*.

2. The bulk of current UTL content, primarily consisting of reportable concepts newly created for UTL is included in the *1326041000000107 | SNOMED CT United Kingdom pathology and laboratory medicine draft content extension module* while it remains in th*e Draft for Trial Use* stage.

3. When UTL content is approved for Live production use in the NHS that content will be migrated to the *748131000000104 | SNOMED CT United Kingdom maintained pathology and laboratory medicine module*.

The *1326041000000107 PaLM Draft* module described above will continue to be used as to publish PreRelease content for review and testing purposes.

The UK Edition of SNOMED CT is complex in structure and the Pathology Team are actively seeking input from technical users and software developers on how to make future releases easier to load and use in software systems. Meeting sessions to discuss this and similar user requirements are publicised via the Pathology Informatics National User Group (PINUG) and our online [Pathology & Diagnostics Information Standards Collaboration Space](). We also welcome direct contact via our group mailbox [Pathologyanddiagnostics@nhs.net]().

For more implementation information on how module dependencies affect the UTL and other pathology and laboratory medicine SNOMED artefacts in deploying SNOMED CT in systems  please contact us via.

- NHS Digital Kahootz collaboration site - [UTL discussion forum]()
- NHS Digital Pathology mailbox - [pathologyanddiagnostics@nhs.net]()

# 6. Documentation for SNOMED CT Releases

Documentation for the SNOMED CT UK Edition can be found on TRUD within the downloadable release packs. It can also be found here.

Documentation for the SNOMED CT International Release is available at:

https://confluence.ihtsdotools.org/display/DOC/SNOMED+CT+Document+Library

This page tabulates the live links to the latest SNOMED CT international release documentation, including formal specifications of SNOMED CT and guidance on use and implementation.

# 7. Feedback and Comments

NHS Digital wishes to receive feedback from clinicians interested in validating and enhancing content, laboratory information managers, LIMS middleware and primary/secondary care suppliers/vendors and those otherwise involved in PBCL/NLMC deployment and oversight.

Feedback, comments and questions on file format, actual content construction and coverage and also on the content model are all most welcome and we will happily work with you on improving specific aspects of the product.

We have established discussion areas on the Pathology and Diagnostics collaboration space to collect general feedback and questions on the UTL release as a whole.

Note: This collaboration area requires users to register for an account with us. To request an account, or to send feedback without registering you can also contact us via email at: pathologyanddiagnostics@nhs.net.

## 7.1. Item-level Feedback

We are trialing a mechanism to allow users to easily send feedback or questions to us on a specific UTL concept, via a link on each item in the downloadable HTML-format review copy of the UTL. Please download the review file from the Pathology and Diagnostics collaboration space and use the "feedback link" displayed against each line item in the HTML documents within the review package zip file.

If you need assistance in locating, accessing or reviewing files or if you need more help accessing SNOMED resources please contact us.

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