NHS Digital

The Unified Test List (UTL) Beta Release Format Specification- *UTL v 0.8.x*

For Consultation

Product Status: Draft for Trial Use

Glossary of Terms

Term / Abbreviation	What it stands for
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,
HL7	HL7 refers to a set of international standards for transfer of clinical and administrative data between software applications used by healthcare providers. These standards focus on the application layer, which is layer 7 in the OSI model.
NLMC	The National Laboratory Medicine Catalogue is a catalogue of SNOMED CT coded laboratory medicine test requests intended for use by Pathology services and their users across the NHS. The status of the National Laboratory Medicine Catalogue is 'Technology Preview', as defined in the IReS Terminology Product Development Lifecycle (external PDF). The catalogue has not been updated since April 2014.
PBCL	The *Pathology Bounded Code List* is a subset of the Read codes that have been specified for use within pathology report messages to identify laboratory investigations. PBCL is the basis for transmitting most pathology laboratory results to GP practices. This list is formally known as the 'laboratory messaging subset of the Read codes'. The PBCL is no longer being updated. UTL is being developed as a SNOMED-CT based replacement for PBCL, which will then be extended beyond the coverage of PBCL.
Read (Read codes)	Read Codes are a coded thesaurus of clinical terms and have been used in the NHS since 1985. There are two versions: Read version 2 (v2) and Clinical Terms Version 3 (CTV3 or v3), both provide a standard vocabulary for clinicians to record patient findings and procedures in health and social care IT systems across primary and secondary care. The National Information Board (NIB) has specified that SNOMED CT is to be used as the single terminology in all care settings in England by 2020, replacing Read v2 and CTv3. The final release of CTv3 was published in April 2018.
SNOMED CT	SNOMED CT is a standardised, multilingual vocabulary of terms relating to the care of the individual. It has been adopted as the standard clinical terminology for the NHS in England, with the direction that SNOMED CT should replace legacy coding standards wherever possible.

Term / Abbreviation	What it stands for
Unicode	Unicode is an open international standard for the encoding, representation, and handling of text intended to support the widest possible number of written languages.
	The Unicode Standard consists of a set of standardised character representations (glyphs) each assigned to a numeric codepoint, and set of standard character encodings, plus a wide range of supporting data to help define how text should be displayed for readability and commonality between IT systems.
	The character repertoire of the Unicode Standard is synchronized with ISO/IEC 10646.

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Contents

1.   Overview

1.1. Scope

This document describes the release formats of the Unified Test List (UTL) which is a data set of SNOMED coded laboratory test 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. 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 communicating, validating and enhancing laboratory test information, laboratory information managers, LIMS, middleware and primary/secondary care software suppliers/vendors, laboratory science quality organisations, commissioners and public health leads and those otherwise involved in current PBCL/NLMC deployment and oversight. The product may also be relevant to a wider audience.

1.3. Context

The UTL is a constrained set of SNOMED coded terms designed to be used either directly in an electronic patient record, in a FHIR message relating to that patient, e.g. 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. It is the successor to the PBCL and NLMC across the NHS estate.

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).

1.4. Status

The UTL is a standard at the *Draft for Trial Use* stage. The content and structure of the UTL are subject to change as the standard develops and the software used in the authoring and publishing process changes. The purpose of the *Beta* (external review) phase is to make the development of the UTL visible and transparent, and gather feedback from as wide a cross section of the audience as possible.

The file formats and data structures used to publish UTL content, as described in this document, are also subject to change.

2.   Description of Release Files

The UTL is currently published in multiple locations in different formats while early development is underway. This choice of formats facilitates exposure to review by all relevant stakeholders, whether those needing a simple readable format for review or a technical file specification for deployment in systems. This will be standardised as the product reaches the Tech Preview and Final product stages of development.

Current publishing locations and content are-

1. Two UK Pathology and Laboratory Medicine (PaLM) SNOMED modules, and a UK Pathology refset published within the main UK Edition release of SNOMED CT. The UK Edition is published as downloadable files on TRUD, and also available interactively via the NHS Digital SNOMED CT Browser. Note-

    - The UK Pathology refSet includes only content that has reached the formal release stage for production use. This refset currently represents a relatively small subset of the UTL codes. The definition and location of this refSet is subject to review.

    - The *1326041000000107 | SNOMED CT United Kingdom pathology and laboratory medicine draft content extension module* (informally UK PaLM Draft module) comprises only content at the *BETA / pre-release* stage suitable for testing in this release.

    - The *1326041000000103 | SNOMED CT United Kingdom pathology and laboratory medicine production content extension module* (informally UK PaLM Live module) is currently unpopulated. The intent is to move UK PaLM content into this module as it is approved for live use in the NHS.

    - Content that has not been approved for live production use is not accessible via the NHS Digital SNOMED CT Browser.

2. A separate UTL download in SNOMED RF2 format comprising only PaLM content may continue to be published in the Pathology area on TRUD. This subset file can be updated more frequently than the full UK Edition.

    - The RF2 download may not contain all UTL content currently available in the BETA Review Pack (see below).

3. A 'human readable' *BETA Review Pack* is published in the UTL section of the Pathology & Diagnostics Information Standards online collaboration space as a downloadable zip file. The BETA Review pack will always contain the most up to date and complete set of UTL content.

    - For the 0.8.0 release a substantial number of concepts (447) expressed as *Qualitative Result of…* terms are included in the *Beta Review Pack*. These terms were published in a *Qualitative Interpretation* form in the 0.7.0 release and have been updated in 0.8.0 in response to feedback and user research identifying that the term 'interpretation' inferred different meanings for GP and lab users. Delivering these terms in the human readable format only allows for formal review by stakeholders and a rapid update if further revision is required.

    - Release 0.8.0 also includes requestable terms for the first time. 350+ requestable Procedure codes are included in the Request sections of the pack.

More details of content changes in each version of UTL are provided in the PaLM Release Overview document published alongside the UTL download in the UTL section of the Pathology & Diagnostics Information Standards online collaboration space.

2.1. Beta Pack Contents

The pack currently contains:

1. UTL reportable term content in HTML table form that can be read in any modern web browser. The HTML files published are-

    a. A full list of relevant terms (*UTL_Report.html*)

    b. A change or delta file of major content changes made between the previous release and the current release (*UTL_Report_Change.html*)

2. Full list (*UTL_Report_Qualitative_Result.html*) and change file (*UTL_Report_Qualitative_Result_Change.html*) for the Qualitative Result reportable terms.

3. Full list (*UTL_Request.html*) and change file (*UTL_Request_Change.html*) for the requestable terms.

    Note: The HTML files include an additional *Feedback Link* column. Clicking the link in this column allows a user browsing the file to send feedback on a specific UTL SNOMED concept directly to the UTL development team in NHS Digital.

4. UTL content is also provided in tab separated value (tsv) format suitable for loading into spreadsheets and other data management tools. These files contain the same data as the corresponding *Full* lists in HTML described above

    a. *UTL_Report.tsv*

    b. *UTL_Request.tsv*

    c. *UTL_Report_Qualitative_Result.tsv*

    Note: See the warnings in *section 2.2 below* about how to read/import these files in software that may try to guess data types on import (notably spreadsheets).

The pack contents for this product may change over time per the Draft status. 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)

A number of supporting documents are also available for download from the UTL collaboration area.

2.2. Schema of Human Readable Beta Release

Based on feedback to date, we currently provide two versions of the human readable distribution:

- HTML Version - for interactive reading / browsing and easily providing item/concept level feedback

- Tab Delimited Version - for easier import into spreadsheets and analytics tools, allowing filtering etc.

Notes:

1. Because of known issues when opening tab-delimited files in spreadsheet applications such as Microsoft Excel, users should take care when importing or viewing the data to ensure that all fields except dates (where applicable) are interpreted as text to avoid problems. The most commonly experienced issue is that SNOMED IDs, being sequences composed solely of numeric characters, will be read as numbers, possibly converted to *Float* data type, and incorrectly processed and reformatted for display. When this happens the display will often be in exponential format (e.g. 1.000234E07).

   In Excel, once data is incorrectly imported as described above the damage cannot be reversed, the import must be done again. The recommended approach for Excel is to use PowerQuery (*Data→Get Data→Text/CSV* in Excel 2016 or later), turn off automatic data type detection, and manually set the correct column types in the *Transform* interface before loading the data.

2. Some of the fields published are not effective in some distribution formats. For example, in the tab-delimited text format the `feedback link` field is static text and cannot act as a hyperlink.

2.2.1. General Principles

2.2.1.1. Character Set (Unicode)

The design principles for both SNOMED CT and UTL adopt Unicode as the selected character set. All text or string values in UTL should be assumed to be Unicode in UTF-8 unless otherwise stated.

Currently, users can expect that the range of Unicode characters used in UTL will fall within the subset of the Unicode Basic Multilingual Plane (BMP) relevant to written European languages. UTL may be expected to include names (e.g. test names) requiring international characters outside the ISO latin-1 range, plus mathematical and Greek symbols (e.g. for units of measure).

In future the range of characters required could extend to non-textual symbols (e.g. emojis). Customers and software vendors should aim to ensure their software environment is "Unicode ready" as part of planning for the adoption of UTL and SNOMED CT.

2.2.1.2. Character Encoding (UTF-8)

Textual representations of UTL data (e.g. csv or tsv files) will use utf8 character encoding unless otherwise stated.

Caveats:

- Unlike earlier standards including PBCL, UTL is <u>not</u> published in 7-bit ASCII or ISO 8859-1 (latin 1). The data must be read using UTF8 encoding. The majority of current content can subsequently be converted to latin-1 safely for incorporation into systems or processes currently limited to latin-1 character sets, but this processing must check for and deal with characters that cannot be converted.

- User should be aware that software vendor interpretations of exactly what is meant by various character and encoding standards, and related terms including *Unicode*; *UTF* (*-8, -16, -32 variants*); *ISO 8859-1; Latin-1*; and Windows *codepage 1252* (aka *Windows-1252*, *cp1252*) are

complex and can contain subtle inconsistencies. Care must be taken to ensure that data is not corrupted during loading or processing by incorrect handling of character sets and encoding.

2.2.2.   Fields & Description

2.2.2.1.   UTL ID

- Purpose:
    - This field contains the internal identifier of the UTL concept. This id provides convenient identification of UTL concepts during the authoring, publication and review phases of content development, including item-level feedback at the Beta / external review stage.
    - The UTL ID is an internal aspect of the UTL publication process. UTL ID values are not present in the RF2 format. UTL IDs are not guaranteed to be persistent over time and may not be present in later human-readable releases of UTL. The UTL ID should not be used as an identifier in other systems, the SNOMED ID is the appropriate persistent identifier for UTL concepts.
- Optional: No
- Datatype
    - This field will contain a String of maximum 16 characters length. The field will contain only numeric digits, however we recommend reading and processing it as a String rather than a number to avoid number reformatting issues.

2.2.2.2.   SNOMED Concept ID:

- Purpose:
    - This field represents the Concept ID of the UTL term.
    - In principle SNOMED IDs for *In Development* (Beta) content are provisional and subject to change. In practice we will aim to avoid IDs being changed unnecessarily, but it is possible that technical changes to production tooling, or design changes to the structure of the Pathology module(s) in SNOMED might force a change of IDs between releases.
- Optional: No
- Datatype
    - This field is an 64bit integer, however we recommend reading it as a String to avoid problems with display reformatting of large numbers. If you use a VARCHAR data type for this field, note that it will need to be VARCHAR(18).
    - Note: Reformatting of numbers, and values that appear to be numbers, is a particular problem with spreadsheet programs and should be checked for when the data is first loaded.

2.2.2.3.   Fully Specified Name

- Purpose:
    - This field represents the `fully specified name` of the UTL concept. Since UTL concepts are SNOMED CT concepts, we refer the user to SNOMED CT reference documentation for a more complete description of this field.
- Optional: No
- Datatype
    - This field is a String, with a maximum length of 255 characters.

2.2.2.4.   Preferred Term

- Purpose:
    - This field represents the `preferred term` of the UTL concept. Since UTL concepts are SNOMED CT concepts, we refer the user to SNOMED CT reference document for a longer description of this field.
- Optional: No
- Datatype
    - This field is a String, with a maximum length of 255 characters.

2.2.2.5.   Property

- Purpose:
    - This field represents the `property` attribute in the UTL concept model, and often represents a quantifiable or measurable characteristic. Many concepts in UTL are described as the `Property of a Thing in a Specimen`, this field represents the `property` of the triad. Please refer to the UTL Editorial Principles documentation for a more complete description of this field.
- Optional: No
- Datatype
    - This field is a String, with a maximum length of 255 characters.

2.2.2.6.   Component

- Purpose:
    - This field represents the `component` attribute in the UTL concept model. Many concepts in UTL are described as the `Property of a Thing in a Specimen`, this field represents a `component or substance` as the `thing` of the triad. Please refer to the draft UTL Editorial Principles for a more complete description of this field.
- Optional: No

- Datatype

  - This field is a String, with a maximum length of 255 characters.

2.2.2.7. Relative To

- Purpose:

  - Certain UTL concepts represent a relationship between two measurable characteristics (for example ratios between values). This field is used for the second element in these concepts

- Optional: Yes

- Datatype

  - This field is a String, with a maximum length of 255 characters.

2.2.2.8. Specimen

- Purpose:

  - This field represents the `specimen` attribute in the UTL concept model. Many concepts in UTL are described as the `Property of a Thing in a Specimen`, this field represents the `specimen` of the triad. Please refer to the draft UTL Editorial Principles for a more complete description of this field.

- Optional: No

- Datatype

  - This field is a String, with a maximum length of 255 characters.

2.2.2.9. Technique

- Purpose

  - This field represents the `technique` attribute that is sometimes used in the UTL concept model. Many result concepts in UTL are described as the `Property of a Thing in a Specimen`, and this is sufficient. However in some cases different methods or techniques are in common use, and those techniques produce significantly different results. If it is important to communicate the technique used to produce the result, a more specific term including the technique can be made available. Please refer to the draft UTL Editorial Principles for a more complete description of this field.

- Optional: Yes

- Datatype

  - This field is a String, with a maximum length of 255 characters.

2.2.2.10. Sub-Category

- Purpose:

  ○ This field represents a category or discipline applicable to the test, where available. Categorisation of UTL concepts is an area that needs further work so this data and the presentation/format are likely to change.

- Optional: Yes

- Datatype

  ○ This field is a String, with a maximum length of 255 characters.

2.2.2.11. Status

- Purpose:

  ○ This field indicates status of the corresponding UTL concept as either *Active* (proposed for live operational use) or some other value. This field is most important in the `UTL Change` file which contains a list of additions, changes/updates and deletions between successive UTL versions. Please refer to the draft UTL Editorial Principles for a more complete description of this field.

  ○ Note that if a SNOMED concept included in UTL refers to a formally published Production (Live) SNOMED concept, the concept itself will be maintained according to the lifecycle and change management rules of SNOMED within the SNOMED system. However UTL entries for content in the *In Development* (Test) status follow the simplified lifecycle model described above. Where a UTL entry refers to an *In Development* SNOMED concept, both the UTL entry and the concept are provisional data for test purposes and follow the simplified change model.

- Optional: No

- Datatype

  ○ As the data structure and content lifecycle for UTL concepts is further refined in future, we would expect to define a predefined list of status values that would be amenable to implementation as an enumerated list (ENUM) field in software that supports that data type. However for the moment we recommend this field is read as a String data type of maximum length 64 characters.

2.2.2.12. Action

- Purpose:

  ○ This field is present in the `UTL Change` file which contains a list of changes to the UTL since the previous release. The value in this field indicates at a high level the type of change that has been applied to the corresponding concept. Possible values are-

Action	Description
Create	The concept was newly created (added) in this release
Update	An existing concept was altered/changed in this release. One or more data fields in the concept record was changed, or potentially a new field column and value was added.
	Note: Where a concept is updated, the lists published in the human-readable Beta review pack for UTL show the full current (new) state of the record, so the *Update* action can also be considered a *Put* or overwrite of the record.
Delete	In normal operations this action will not be used. An existing code will typically have its status changed to *Deprecated* or *Inactive* if it is no longer required. However in the early stages of development deletion of a code may occur under specific circumstances.

Please refer to the draft UTL Editorial Principles for a more complete description of this field.

- Optional: No

- Datatype

  - This field is a String, with the possible values described above.

2.2.2.13. Feedback Link

- Purpose:

  - This field is optional and is only effective in the HTML version of the UTL Human Readable files. Clicking on the `feedback link` which is present in this field opens an email window, with prefilled values identifying the concept, allowing the user to provide feedback about that concept directly to the NHS Digital editorial team. Please refer to the draft UTL Editorial Principles for a more complete description of this field.

- Optional: Yes

- Datatype

  - This field is a hyperlink element (in HTML), otherwise it is a plain string containing the text: "Feedback Link".

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

Draft for Trial Use Status

The files are being published here for BETA 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.   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 provides live links to the latest SNOMED CT international release documentation, including formal specifications of SNOMED CT and guidance on use and implementation.

5.   Feedback and Comments

NHS Digital wishes to receive feedback from clinicians interested in validating and enhancing UTL 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, content construction and coverage and also on the content model are all welcome.

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 contact us via email at: pathologyanddiagnostics@nhs.net.

5.1. Item-level Feedback

The Beta Review Pack for UTL offers a built-in feature for direct item-level feedback via a link on each item in the downloadable HTML-format files. Please download the zip package 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.

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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