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The National Laboratory Medicine Catalogue (NLMC): Editorial Principles

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Reviewers:

This document must be reviewed by the following:

Name	Signature	Title / Responsibility	Date	Version
Gifford Batstone		National Clinical Lead for Pathology, OCCO		
Martyn Forrest		Director of Knowledge Requirements and content, NHS CFH		
Vicki Gledhill		NHS CFH Pathology Programme Manager		
Peter Furness		Chairperson, Royal College of Pathologists.		

Approvals:

This document must be approved by the following: <author to indicate approvers>

Name	Signature	Title / Responsibility	Date	Version
NLMC Board				

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Related Documents:

These documents will provide additional information.

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1 The National Laboratory Medicine Catalogue

1.1 Introduction

The National Medical Laboratory Catalogue (NLMC) is a relational database that defines a dataset to support the design and delivery of a national laboratory medicine catalogue of approved pathology tests that could be requested by clinicians and other authorised care providers within the NHS. The catalogue inherits and builds on content generated by earlier work such as the Pathology Bounded Code List (PBCL) and various regional initiatives to deliver electronic Pathology Order Catalogues as part of Care Records Service (CRS) implementations of electronic Order Communications. This content as it relates to orderable test items has to be reviewed and where necessary modified according to defined editorial principles prior to inclusion in the NLMC. There are several key themes inherent in the conception of the NLMC that in combination make it distinct from these earlier initiatives:

The Dataset is system independent and as a result could be applied to the design and delivery of any electronic pathology test catalogue regardless of the order communications solution supplier or clinical environment. The NLMC will be a living dataset that will evolve over time and adapt to the needs of the NHS.

The Database schema is designed to support a post-coordinated approach to SNOMED CT binding for purposes of clinical coding and clinical audit. Whilst it is not currently possible (March 2009) to implement such solutions in real world systems such a design is firmly aligned with the declared vision of the NHS with respect to SNOMED coding.

The NLMC database and its content will be nationally defined, owned entirely by the NHS and quality assured on behalf of the NHS by the governance process hosted by the Royal College of Pathologists.

Once the dataset has matured it will be submitted to the Information Standards Board (ISB) for consideration as a UK information standard if successful the establishment of the NLMC as an information standard will provide an incentive for it to be actively supported within solution design by all suppliers of pathology order communications solutions to the NHS.

1.2 Vision

A nationally maintained, standards based clinical dataset which will facilitate the design and delivery of a comprehensive catalogue of pathology requests validated for use in the NHS. The NLMC will represent tests that may be requested by NHS care providers through any electronic order communications solution independent of system supplier. Clinicians NHS wide will have confidence that pathology test requests are represented in a standard, unambiguous way when electronically requesting pathology services.

In time, the terms defined in the NLMC will also be used consistently for test reporting, with consequent benefits in unambiguous interpretation, including improved reliability when combining data from several sources.

This semantic interoperability will facilitate easy searching and accurate requesting of pathology tests helping to improve service efficiency and patient safety.

The catalogue is intended to link with and facilitate the development of authoritative guidance for clinical staff and patients on the use and interpretation of each test, including expert decision support systems. The use of a single unambiguous name (and associated code) for each test is a prerequisite to the development of such systems in a user-friendly manner that integrates with other clinical data systems.

The NLMC dataset will lay the foundation for future benefits relating to improved clinical audit, decision support and knowledge management via integration with care pathways and Map of Medicine.

2 Editorial Principles

2.1 Overview

The editorial principles are a reference manual for NLMC content. It is essential that content such as the different test request names are represented in a consistent manner that conforms to agreed standards. As with the NLMC dataset itself it is expected that the editorial principles will evolve over time. For pathology tests the key NLMC attributes which will be the subject of the initial standardisation, quality review and assurance activities are:

- The NLMC catalogue number: An internally assigned number that uniquely identifies the test request entry within the NLMC database.
- The NLMC fully specified test request name (No character limit)
- The SNOMED CT code associated with the test request
- The default national discipline the test is associated with. e.g. Biochemistry, Haematology etc. Assigning a discipline to a test in the NLMC does NOT limit the actual department that performs the test within local Trusts.
- The NLMC test request display name (limited to 30 characters)
- The units normally associated with the test result
- Test name alternative names: essentially synonyms for a test that make it easier to find and increase the probability that the correct test will be placed.
- The name of the specimen type that needs to be collected for the test (e.g. blood) plus the name of the specimen type used to perform the test (e.g. plasma or serum)
- The SNOMED CT code associated with the specimen types
- The topography indicator; if not null then specimen topography information (body site origin) is essential for the safe and efficient requesting of the test in question.
- The laterality indicator; if not null then specimen laterality information is essential for the safe and efficient requesting of the test in question.
- The morphology indicator; if not null then specimen morphology information is essential for the safe and efficient requesting of the test in question.
- Special handling instructions for a collected specimen where appropriate for the test to be performed e.g. Keep in dark, on ice or deliver within 15 minutes of collection.

- The method used in the analysis, if relevant. This should not normally be part of the test name but in some circumstances it will be needed for appropriate reporting, interpretation and data combination. See section 5 of this document ('Method of analysis').

The editorial principles to assure the quality of NLMC content relating to these attributes is discussed in more detail on the pages that follow.

3 Deriving Test Names and Synonyms

3.1 Principles for defining the NLMC fully specified test request name:

3.1.1 *Purpose:*

This name is a full description of the request that when ordered will initiate the performance of the associated pathology test. The NLMC full test request name must have a clarity and accuracy that can withstand rigorous scientific or legal scrutiny. It is possible that some suppliers may prefer to use the fully specified name for display and searches. In some cases the NLMC full request name may be identical to the NLMC test request display name.

3.1.2 *Structural composition and format*

The structure for the NLMC full test request name is:

<Name of analyte or organism to be measured><space><measure type>

No character limit

3.1.3 *One unique clinical concept per test request*

Each NLMC full test request name will apply to a single orderable test item only. Combinations of tests within a single request name are not allowed. This is to ensure a unique SNOMED CT concept ID can be assigned to the request. Despite having multiple components tests such as "Urea and electrolytes" or a Full blood count would be considered a single orderable item and so valid whereas an orderable item name such as "Amiloride level plus potassium level" would not.

3.1.4 *Patient pre-conditions*

Patient preconditions such as "Fasting" should not be part of the fully specified test request name for discrete items orderable by clinicians. This information should be recorded as additional clinical information during the placing of the request if it is clinically relevant. So discrete orderable items such as: "Fasting glucose level" would not be included in the NLMC. This does not preclude such order items being built as part of local implementations to support profile requests e.g. Glucose Tolerance Test. In this way, preconditions can be recorded if they can be legitimately applied to tests within the catalogue. Examples include non fasting, fasting, random, timed sample, timed collection, pre-dose, post dose.

3.1.5 *Spelling*

All spellings will be according to standard English spellings (e.g. faecal NOT fecal, oesophagus NOT esophagus)

3.1.6 *Use of abbreviations, acronyms and symbols*

These will NOT be used in defining the fully specified test request name unless a specific exception is cited in the editorial principles. E.g. examples of excluded use would be

Use of “Na” to represent “Sodium”

Use of “&” to represent “and”

Use of “FBC” to represent “Full Blood Count”

Use of subscripts and superscripts should be avoided

3.1.7 Use of international or national standard classifications

International or national standard classifications and conventions should be used consistently wherever possible. Some examples of useful online resources in this respect are given in Appendix 1 but this is not an exhaustive list

Inorganic analytes will be named based on the periodic table names not their symbols.

Organic analytes will be named according to most common, best practice usage within the medical and pathology sciences. It is not expected to use the IUPAC naming conventions throughout even though it is an International standard e.g. The common name “Vitamin D2” is acceptable as is the trivial alternative “Ergocalciferol”, the systematic name,

” (1S)-3-[2-[(1R,3aR,7aS)-1-[(2S,5R)-5,6-dimethylhept-3-en-2-yl]-7a-methyl-2,3,3a,5,6,7-hexahydro-1H-inden-4-ylidene]ethylidene]-4-methylidene-cyclohexan-1-ol “, should not be used.

3.1.8 Use of capital letters

Capital letters should only be used in the following circumstances

The full test request name will begin with a capital letter.

Eponyms that may form part of the full test request name will be capitalised in the usual manner (e.g. Bence Jones’ protein level)

3.1.9 Punctuation

Full stops should not be included at the end of fully specified test request names.

Apostrophes should be used where it is grammatically correct to do so

Commas should not be used within the test name unless warranted within a chemical structure e.g. 2,3-diphosphoglycerate.

Use of colons are limited to indication of ratios e.g. X:Y ratio

3.1.10 Hyphenation

Prefixes and numeric ranges should be hyphenated except where the common use of a word would make hyphenation irregular.

Examples of appropriate hyphenation:

- Anti-cardiolipin level
- Non-motile sperm count
- Alpha-1-anti-trypsin level
- 17-Hydroxyprogesterone level
- 32-33 split pro-insulin level

3.1.11 Use of Brand names

Use of brand names should be avoided e.g. “Clinistix” may be a very common branded Point of Care Test (POCT) method for measuring the glucose level in urine but it should not be used in the fully specified test request name, see also 3.1.1.12

3.1.12 Use of numbers

Numbers in the NLMC test names should be represented as per their common usage which will usually be based on Arabic numerals e.g.

17-Hydroxyprogesterone level

32-33 split pro-insulin level

Where Roman numerals are in common usage their use is permitted e.g.

Clotting factors such as Factor V

3.1.13 Description of performing location

Such information should not be included in the fully specified test name. For instance terms such as “send out” or a central national testing centre abbreviation to which a test must be sent should not form part of the test name

3.1.14 Description of methods

Test methods (e.g. ELISA) should not be included as part of the fully specified test name as these will vary depending on the services provided by the local pathology lab. Point of care testing (POCT) is considered to be a method. Reporting methods (e.g. Mean of Medians) should not be included as these will vary depending on the services provided by the local pathology lab.

However, it is recognised that there are circumstances where it may be important to record the method used as part of the result reporting but not as a component of the test request name. Understanding the method used to generate the result is important, mainly in relation to interpretation and data combination. For this reason ‘Method of analysis’ is included as an optional item in the Catalogue dataset. See section 5 of this document.

3.1.15 Representation of Greek symbols

Greek symbols where they form part of the full test request name will be spelt in full and hyphenated (e.g. alpha-foetoprotein)

3.1.16 Use of the “%” symbol

The percentage symbol may be used as appropriate, e.g. platelet count % in blood

3.1.17 Grammar

Possessive pronouns such as “of” should be avoided wherever possible, e.g. partial pressure of oxygen.

Prepositions such as “with” can be used in full where essential, shorthand abbreviations should not be used e.g.:

Cell Count w/ Diff (INCORRECT)

Cell count with differential (CORRECT)

Logical conjunctions such as “and” can be consistently used in full do not use “plus” or ampersand (“&”).

Proper Nouns should be capitalised appropriately e.g. Von Willebrand’s factor.

3.1.18 *Specific words, guidance on usage*

The use of the word 'total' is often redundant and should not be used when it doesn't add any clarity or require explicit distinction from a measured level. e.g. "Protein level" is sufficient "Total protein level" would be redundant.

The use of generic terms for classes of compounds should be avoided when they do not accurately represent the thing being measured e.g.

"Ethanol level" should not be represented as "alcohol level"

"Glucose level" should not be represented as "blood sugar level"

The word "Free" is an adjective that should precede the relevant noun in the test name. So the order of use should be: 'Free androgen level'

3.1.19 *Measure Types*

Measure type here refers to the specific element of the NLMC fully specified test request name as defined in section 2.2.1.1:

<Name of analyte or organism to be measured><space><measure type>

The following standard measure types are defined for recommended use in composing NLMC fully specified request names:

level:

Refers to any quantitative measure of the analyte or organism that is the subject of the test. Levels encompass expected reporting options such as enzyme activities, molar concentrations and activities are all levels.

investigation:

A broad category for use where the outcome of a test is likely to be an interpretive report rather than a numeric measurement, for example histology, cytology and some microbiological investigations. It should not be used if it is possible to use a more specific and appropriate measure type

output:

Refers to a level measured on an analyte that is excreted over time e.g. as for 24 hour urine samples e.g. "Sodium output"

screen:

Refers to any qualitative measure of an analyte or organism (basically can its presence be detected or not?)

ratio:

A ratio is only valid for analytes measured on the same sample. It can exist as a unique test or be made up of two existing catalogue entries. If the latter, the codes for these will be incorporated in the comments section. eg CK-MB/CK ratio NLMC 1883 comprises CK-MB level (NLMC4724) divided by CK level (NLMC1852).

calculation:

A calculated value is a test result derived from one or more analytes utilising a formula. It will exist as a unique test. The codes for the analytes used in the calculation will be incorporated in the comments section; eg creatinine clearance NLMC 1855 derived from creatinine level (NLMC0874) and creatinine output (NLMC1854)

MC & S:

Refers to a Microscopy, Culture and Sensitivity, this is the only acceptable format for this measure type e.g. MC and S should not be used.

phenotype:

Used specifically in relation to phenotypic determination.

genotype:

Whether a particular gene or gene variant or mutation is present.

genotypic expression:

Used in connection with the determination of whether a specific gene or set of genes is being actively expressed.

3.1.20 *Order sets*

The NLMC glossary (Appendix 2) defines an order set:

“An order set comprises a grouped set of individual requests that can be automatically requested at the same time by placing a single request for the parent order set. The order set request components can usually be ordered individually in their own right and may be comprised of requests that require different specimens and/or specimen types.”

Currently order set components are subject to wide variation across the NHS and so in the many cases cannot be nationally standardised for this reason identification of components is not within the current scope of the NLMC which focuses on National content.

In some cases the order set request name can qualify for inclusion in the NLMC. Some criteria for justified inclusion of an orderset request in the NLMC are given below

- a) Validated existing common usage. Urea and Electrolytes (U+E) is an order set that all NHS pathology services recognise and so this should qualify for inclusion in the NLMC however the components of a U+E vary widely from service to service and are subject to local discretion as such the components of a U+E cannot currently be nationally defined or mandated and so should not come within the scope of NLMC content.
- b) Standard order sets that support a calculated reportable result e.g. It makes no sense to request an “adjusted calcium level” if the mandatory components needed to derive the result, namely a calcium level and an albumen level are not requested at the same time in order to allow the calculation to be performed and the result reported.
- c) Standard order sets that can be applied nationally also contribute to decision support when focussed around:
 - National Treatment guidelines such provided by National Standard Frameworks (NSFs)
 - National standards relating to best practice and safety such as those documented by the best practice.
 - Best practice agreed to be nationally applicable with very little local variation after peer review and support from appropriate governance.

Some order sets are clearly much more general and locally driven and so these should not be defined as National content for this reason. Some examples of local order sets might be:

Post Op. order set, A+E order set, renal dialysis order set etc.

The fact that an order set does not appear in the NLMC does not prevent the addition of locally defined order sets as part of local Trust design and implementation providing the individual components of any locally defined order sets are available within the NLMC.

3.1.21 Profiles

The NLMC glossary (Appendix 2) defines a profile as:

“A profile consists of a single investigation (request) which returns a number of test results, typically derived from analysis of the same specimen, that are reported together. The single request does not explode into additional requests as with an order set. The individual result components are usually not requested individually in their own right”

As to whether a profile should be included as an entry in the NLMC the considerations for inclusion are identical to those for order sets. So for example profiles such as Full Blood Counts or Glucose Tolerance Test are well defined and in common usage by clinicians and pathology services across the NHS and so these profiles are included as entries in the NLMC. There is however currently no requirement to define the components that constitute an included profile.

On the other hand profiles relating to specific analyser panels with names such as CHEM7 are very much locally defined and as such would not be candidates for inclusion in the NLMC; it would however be possible to create such panels as part of the local configuration and implementation

3.2 Principles for Defining NLMC test request display names

3.2.1 Purpose

NLMC test request display names relate directly to what a clinician might be expected to see and search upon within any clinical system that adopts the NLMC as part of its implementation of electronic pathology order communications.

These principles have been drawn up with the expectation that ‘search within’, sometimes referred to as a ‘contained search’ will be available for use within the order communications solution being implemented. This ensures that upon ordering a clinician does not necessarily need to type the beginning characters or words contained in the Display name or Alternative search term to successfully find an item in the order catalogue. If the characters or word entered as a search criteria appear anywhere within a Display name or Alternative search term then all tests which have a Display Name or Alternative search term which contains that word or characters will appear to the user.

Therefore: Full Blood Count (FBC), blood will present if the clinician types ‘Full’ or ‘FBC’. This may, in many cases reduce the need for Alternative search terms.

The display name represents the primary master display name for the test item in the NLMC. Primary display names have to be unambiguous and accurate and so share most of the editorial principles associated with the NLMC fully specified test request name with some challenging exceptions that are documented below.

3.2.2 Structural composition and format

The structural composition of the NLMC test request display name is:

**<Name of analyte or organism to be measured> <(acronym)>
 <space><measure type>**

The inclusion of an acronym is optional

30 character limit including spaces between words

3.2.3 Use of abbreviations, acronyms and symbols

A limited set of standard abbreviations and acronyms are approved for use within test request display names (See Appendix 3). It is necessary to ensure that these are used consistently and not only to help keep the character length of the request test name within the 30 character limit. If the same words or terms used in different test request display names are sometimes abbreviated and sometimes not the unpredictability will make it more difficult to find the desired request when searching. If an abbreviation is approved it should normally be use throughout the catalogue or throughout a given discipline if a limiting scope applies. An example is the approved abbreviation of the word ‘antibody’ to “Ab” for use throughout Immunology which would mean that the word “antibody” should not appear by itself in any Immunology test request display names.

Acronyms can be used within test request display names and must be enclosed in parentheses. Acronyms should only be used if they are well established and in common clinical usage.

e.g. Full Blood Count (FBC)

If inclusion of an acronym takes the character count above 30 then the acronym should be considered for inclusion as an alternative name (synonym) to the test request display name

Chemical symbols and chemical shorthand are not approved for use within test request display names.

e.g. “Na level” to represent “Sodium level” or “EtOH level” to represent “Ethanol level” are not acceptable.

3.2.4 Use of capital letters:

Capitalisation of letters within acronyms used as part of test request display names should follow the accepted scientific usage.

e.g. “IgG” for Immunoglobulin G NOT “IGG”

“DNA” for deoxyribonucleic acid NOT “dna”

3.2.5 Representing Greek characters:

When present as part of the accepted common description of an analyte chemical structure it is permissible to abbreviate them as indicated in the table below combined where necessary with the appropriate hyphenation. This is primarily to be used if the 30 character limit on the display name is likely to be exceeded if the full representation is incorporated

Full representation	Accepted abbreviation
Alpha	a
Beta	b
Gamma	g

Delta	d
Epsilon	e

Examples:

5-a-dihydrotestosterone level

b-human chorionic gonadotropin

In some cases the abbreviation may in fact hinder searching if a commonly used name is altered e.g. alphafoetoprotein (AFP) versus a-foetoprotein level (AFP)

3.3 Principles for defining alternative names or synonyms:

3.3.1 Purpose

Alternative names for the primary test request display name are optional and should only be created where definite benefit can be derived

The editorial principles that apply to the definition of the primary test request display name also apply to alternative names and synonyms.

Alternative names or synonyms introduce reasonable flexibility into the ordering process by allowing clinically valid alternative names for the same orderable test. The purpose of synonyms is to increase the probability that a requesting clinician will find and request the appropriate pathology test from the order catalogue.

The expectation is that if a pathology request is initiated based on an alternative name within the NLMC the actual order, once signed will be placed as the primary test request display name so ensuring consistency.

3.3.2 When should alternative names be created?

What follows are some criteria for considering whether the creation alternative names is warranted and some guidelines to format

1. Are there two valid names for the same test in common usage?

e.g. Vitamin D2 level (primary test request name)

Ergocalciferol level (alternative name)

2. Is the test also used to screen for a specific disease or condition?

e.g. "Short synacthen test" might have an alternative name of "Congenital adrenal hyperplasia screen" associated with it.

Or

b-human chorionic gonadotrophin level in urine might have an alternative name of "Pregnancy screen" associated with it

3. If inclusion of an acronym in the primary test request name pushes the number of characters above the 30 character limit then the acronym could be used as the basis for an alternative name

e.g. 5-hydroxyindoleacetic (5-HIAA) acid level 40 characters

but

5-hydroxyindoleacetic acid level with 5-HIAA level as an alternative name is much better

4. When implemented the NLMC will be present a searchable pick-list of valid orderable pathology request items including both primary test request names and their associated alternative names. Taking the example given in point 3. (above) consider what would be displayed if a clinician searches for 5-hydroxyindoleacetic acid level in the catalogue. If “5” is entered as the search term a contained search will return:

- a) 5-hydroxyindoleacetic acid level (primary test request name)
- b) 5-HIAA level (alternative name or synonym)

Returned search hits are often displayed alphabetically and so these two catalogue entries would display next to one another possibly causing confusing as to why there are two separate entries for the same thing. A better example of a well chosen synonym might be:

- a) Acid fast bacilli (AFB) MCS (primary test request name)
- b) Tuberculosis screen (alternative name or synonym)

So trying to think how catalogue hits will be displayed to the end-user is an important part of the process when deciding suitable alternative names for test requests. If possible alternative test request names should be alphabetically distant from primary test request names.

4 Specimen type names

4.1 Purpose

There are two classes of specimen type to be defined in association with each test request they are:

- a) The *collected specimen type*: the specimen collected from the patient (e.g. blood)
- b) The *analysed specimen type*: the specimen that the actual test measurement is performed on usually after laboratory processing of the collected specimen (e.g. serum or plasma)

Although this will be dealt with in later principles it is worthwhile mentioning that the collected specimen type can sometimes have other attributes associated with it that are essential pieces of information if the request is to be processed safely. These other attributes are topography, laterality and morphology.

4.2 Collected specimen type names

4.2.1 Structure of collected specimen type names

A list of collected specimen types currently in use is shown below. Collected specimen type names will have the structure:

<collected specimen type><space><collection method>

4.2.2 Specimen Collection methods

Examples of specimen collection methods currently in use in the NLMC are:

- arterial
- venous
- capillary
- timed

Unit abbreviations for time period accepted within Systeme Internationale (SI) will be used where appropriate i.e.

“min” = minute

“h” = hour

“d” = day

Example: urine 24h

4.2.3 List of proposed collected specimen type names

Below is the proposed initial list of collected specimen types for use

air	calculus	skin
aspirate	cells	slide
bile	CSF	sputum
biopsy	dairy product	swab
blood	fluid	tissue
	faeces	urine
	food	
	hair	
	medical device	
body fluid	nail	
bone	pus	
bone marrow	saliva	
breath	semen	vomit
		water

4.2.4 List of proposed collection methods

arterial
venous
capillary
mid stream sample
catheter sample

needle aspirate
smear
Pooled
scraping
curreting
needle biopsy
excision biopsy
surgical resection
post mortem
Timed collection

4.2.5 *List of proposed analysed specimen type names*

To date only six analysed specimen types have been defined. The analysed specimen types are attributes of the reportable or result and as such should not form part of the test request names which should only incorporate collected specimen types if need be. For example a test request could have an associated collected specimen type of “blood” which could be reported as either a serum or a plasma level depending on how the local pathology service reports the result.

- plasma
- serum
- whole blood
- red cells
- white cells
- platelets

5 Method of analysis

The method of analysis should not form part of the test name. Consequently there has been debate as to whether ‘Method of analysis’, as a data item, should form part of the current version of the Catalogue. However, there are undoubtedly situations where it is necessary to define the method of analysis is results are to be reported, interpreted and combined correctly. Different methods may result not only in different reference ranges but even completely different units or types of measurement, such as a measure of concentration, a titre or simply ‘positive’ or ‘negative’. Different methods of analysis may produce results with radically different levels of reliability. For example, there will be situations where a measurement is made outside the laboratory (e.g. point of care testing) but the result is stored in a laboratory database. In interpreting or combining results it is essential to know whether differences between results might be a consequence of these factors rather than representing genuine differences due to changes in the patient’s condition.

We are also aware of ‘legacy’ systems where the method of measurement (e.g. POCT) is used as part of the test name and this information is needed for safe

subsequent storage of the data. In this situation, 'Method of analysis' can be used to facilitate backward compatibility. Its use as part of a test name is however deprecated.

6 Specimen Topography and morphology indicators

6.1 Purpose

The morphology and laterality indicators are two separate indicators that determine whether there is a requirement to provide either morphology or topography information to ensure the safe and efficient processing of a particular test request by the laboratory. The review team does not have to define the specific data items. If the indicator for either attribute is not null then the appropriate information is required.

The reason for this approach is so as not to restrict the design approach of different supplier solutions to meeting the requirement to provide the information as part of local design and implementation. Morphology and Topography information, if required, could be provided at the time of request in a variety of ways within solution applications, for example:

1. drop down list of specific data items valid for a specific specimen type which the requester chooses from whilst placing the request
2. information could be incorporated into the collected specimen type name e.g. colon polyp biopsy
3. it could be provided as free text using a mandatory text box on the electronic request form

All that the review has to do is confirm whether or not topography and/or morphology information is required to be provided for a particular collected specimen type association by setting the indicators appropriately. A similar approach applies to the laterality indicator discussed later.

6.2 Definitions and examples:

6.2.1 Topography:

"The physical or natural features of an object or entity and their structural relationships"

This is a broad definition however in relation to specimens the relative branch of topography is usually topographic anatomy dealing with regions of the body especially with reference to diagnosis and treatment of disease or injury in order to provide information regarding where the specimen was taken from.

Example of where topography may be relevant:

A collected specimen of "biopsy" could have numerous topographies associated with it dependent on which part of the body the biopsy was taken from.

6.2.2 Morphology:

Morphology is a branch of biology dealing with the form and structure of whole organisms and their constituent parts.

Again another very broad definition but in relation to specimens relevant morphology information is likely to relate mainly to tissue, cells and macromolecules.

Examples of where morphology information may be relevant:

- a) A collected specimen type of “biopsy” may have both topography and morphology data items e.g. colon (topography) and polyp (morphology)
- b) A collected specimen type of “cells” may have associated morphology data items of WBC, RBC or fibroblasts
- c) A collected specimen type of “tissue” may have associated morphology data item of “cyst

7 Specimen Laterality indicator

The side of the body, left or right, from which the specimen is taken. The laterality indicator determines whether there is a requirement to provide laterality information to ensure the safe and efficient processing of test request by the laboratory. If not null then laterality information is required.

Laterality is an attribute of specimen topography that may be relevant information when the specimen is from a bilateral organ or limb.

For example:

Vitreous humour <specimen type>
Eye <topography>
Left <laterality>

8 Specimen special handling instructions

These instructions are optional and only need to be defined where needed to ensure the integrity of the analyte to be measured. They should be consistent, short and to the point some examples are given below

- On ice
- Keep Warm
- Keep in dark
- To LAB NOW

Note: Instructions such as “Biohazard” have not been approved for use since all pathology specimens represent a possible biohazard and should be handled as such by default.

9 Appendices

9.1 Appendix 1: Links to useful classifications and standards

This is not meant to be an exhaustive list of resources more a useful starter pack

Naming of bacteria: DSMZ, Bacterial Nomenclature Up-to-Date

http://www.dsmz.de/microorganisms/main.php?contentleft_id=14

Naming of viruses: International Committee on Taxonomy of Viruses (ICTV):

<http://www.ictvdb.rothamsted.ac.uk/>

Naming of fungi: UK National culture collection:

<http://www.ukncc.co.uk/html/Databases/search.asp>

Naming of Human Leucocyte Antigens (HLA)

<http://www.ebi.ac.uk/imgt/hla/dictionary.html>

Naming of Drugs: British National Formulary (BNF):

<http://www.bnf.org/bnf/bnf/current/63581.htm>

Naming of human genes and variants: Hugo Gene Nomenclature Database (HGNC)

http://www.genenames.org/cgi-bin/hgnc_search.pl

SNOMED CT: International Health Terminology Standards Organisation (IHTSO):

<http://www.ihtsdo.org/snomed-ct/>

International Union of Biochemistry and Molecular Biology: Nomenclature including proteins and enzymes

<http://www.chem.qmul.ac.uk/iubmb/>

International Union of Pure and Applied Chemistry: Recommended trivial names for some compounds and as well as full systematic names:

<http://www.chem.qmul.ac.uk/iupac/>

The NHS Data Dictionary

<http://www.datadictionary.nhs.uk/>

Appendix 2: Glossary of Terms

Embedded below is version 0.5 of the NLMC Glossary of terms (April 2008) as a Word 2003 document. This document is likely to be frequently updated so please check for newer versions in circulation.



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Settings\hobe1\My D:

9.2 Appendix 3: Approved Abbreviations

Original Term		Abbreviation
Alpha		a-
Antibody		Ab
Antigen		Ag
Beta		b-
Delta		d-
Epsilon		e-
Gamma		g-
Haemoglobin		Hb
Immunoglobulin	(Immunology only)	Ig
Immunoglobulin A	(Immunology only)	IgA
Immunoglobulin E	(Immunology only)	IgE
Immunoglobulin G	(Immunology only)	IgG
Immunoglobulin M	(Immunology only)	IgM
Isoenzyme		Isoenz

9.3 Appendix 4: Approved Acronyms

Original Term	Acronym
Carcinoembryonic Antigen	CEA
Cerebrospinal fluid	CSF
Cluster of Differentiation	CD
Creatine Kinase	CK
Cytomegalovirus Virus	CMV
Deoxyribonucleic acid	DNA
Epstein-Barr Virus	EBV
Follicle Stimulating Hormone	FSH
Full Blood Count	FBC
Glucose 6 Phosphate Dehydrogenase	G6PD
Herpes Simplex Virus	HSV
Human Growth Hormone	hGH

High density lipoprotein	HDL
Human Chorionic Gonadotrophin	hCG
Human Immunodeficiency Virus	HIV
Human Leucocyte Antigen	HLA
5-Hydroxyindoleacetic	5HIAA
Kaolin Clotting Time	KCT
Lactate dehydrogenase	LDH
Low density lipoprotein	LDL
Luteinising Hormone	LH
Methicillin Resistant Staphylococcal Aureus	MRSA
Microscopy Culture and Sensitivity	MCS
Point of Care Investigation	POCT
Prostate-specific antigen	PSA
Proton-coupled folate transporter	PCFT
Radio-Allergo Sorbent Investigation	RAST
Red Blood Cell	RBC
Ribonucleic acid	RNA
Thyroid Stimulating Hormone	TSH
Tubercle bacillus (Tuberculosis)	TB
Venereal Disease Research Laboratory	VDRL
Very long chain fatty acid	VLCFA
Very High Density Lipoprotein	VHDL
Very low density lipoprotein	VLDL
White Blood Cell or leukocyte	WBC

9.4 Appendix 5: NLMC FAQs

9.4.1 What is the purpose of the NLMC?

The objective of the National Catalogues is to provide a nationally validated, quality assured common library of pathology orderable test items that may be requested by any NHS clinician working in any healthcare sector. Having a catalogue of test requests and specimen types that are all named the same in all NHS pathology services should make it easier for clinicians to find and request pathology tests regardless of which NHS organisation they are working in. The creation and use of standardised, unambiguous test names will have benefits in terms of patient safety by helping to reduce inappropriate ordering. The NLMC will facilitate the design and delivery of pathology electronic Order Communications solutions from any NHS supplier.

9.4.2 Do NHS pathology Services have to deploy the entire NLMC?

No they do not. Some pathology services will offer different tests to others. It is envisaged that at implementation it will be possible to create a locally defined organisation specific filtered view of the NLMC to deploy in order to define the tests that can be seen and requested as part of the local pathology services. It is also envisaged that there will be the facility to activate or inactivate tests that appear in the local view of the NLMC if or when the pathology tests offered as part of a service change over time.

9.4.3 How can I see what tests are in the NLMC?

The Department of Health, supported by NHS CFH, has commissioned work to create a web enabled view of the NLMC which should be available from summer 2009 or possibly earlier.

9.4.4 What is the process for adding missing tests to the NLMC?

The NLMC will be a living dataset which will continually evolve and develop over time from the date of its initial release. The two most common circumstances under which new test requests may need to be added to the NLMC are:

- a) Omission of a test that is in use in both Pathology and the NHS that for some reason is not represented in the current version of the NLMC.
- b) Emergence of new tests becoming available in the marketplace as a result of medical or technological advances.

With respect to a): NHS CFH is putting in place a governance process to manage and quality assure the content of the NLMC. This process will be hosted by the Royal College of Pathologists (RCPATH) on behalf of the NHS. Included will be the facility to allow submission of requests for change including addition, deprecation and modification of test related content within the scope of the NLMC dataset.

With respect to b): these tests will have to go through formal evaluation by an appropriate National body and approval for clinical use obtained before they can be considered for addition to the NLMC

9.4.5 Can the portion of the NLMC catalogue deployed locally be modified locally?

The content derived from the NLMC is nationally defined and will not be directly modifiable locally at Trust level. This includes items such as test names and associated specimen type names. It is important to understand that the NLMC dataset is quite a small well defined set of system independent attributes that relate to pathology test requests. The NLMC does not seek to exhaustively define or standardise all the attributes that impact on the implementation of electronic pathology order communications.

Any modifications to NLMC content will be subject to change control and managed through the RCPATH hosted governance process (see 8.1.4.4) above)

9.4.6 Is the NLMC a systems implementation tool?

The NLMC dataset will facilitate the design and delivery of electronic pathology order communication solutions. It is not a system implementation tool, the information in the NLMC being system independent and applicable to any order communications solution from any supplier.

9.4.7 What is the relationship between the NLMC and the impNLMC?

There are two complimentary datasets that will impact the design and implementation of pathology order catalogues across the NHS. The nature and

definition of these two databases and the relationship to one another is discussed below

The NLMC

- Nationally defined content
- Content quality assured by the Royal College of Pathologists on behalf of NHS
- Builds on previous work e.g. Pathology Bounded Code List (PBCL)
- Small system independent dataset stored in a relational database
- Initially focussed on attributes relating to the request.
- Essentially a tool that informs design

The NLMC attributes include such items as: Test request display name and specimen type names also because the dataset is represented in a relational database the NLMC also defines some of the expected relationships between attributes e.g. what are the valid specimen types that can be associated with a given test. This content of the NLMC will be quality assured and governed by the Royal College of Pathologists who will host the NLMC Governance Board on behalf of the NHS. The NLMC Board is currently expected to be functional in summer 2009 and will serve a broad range of major NLMC stakeholders.

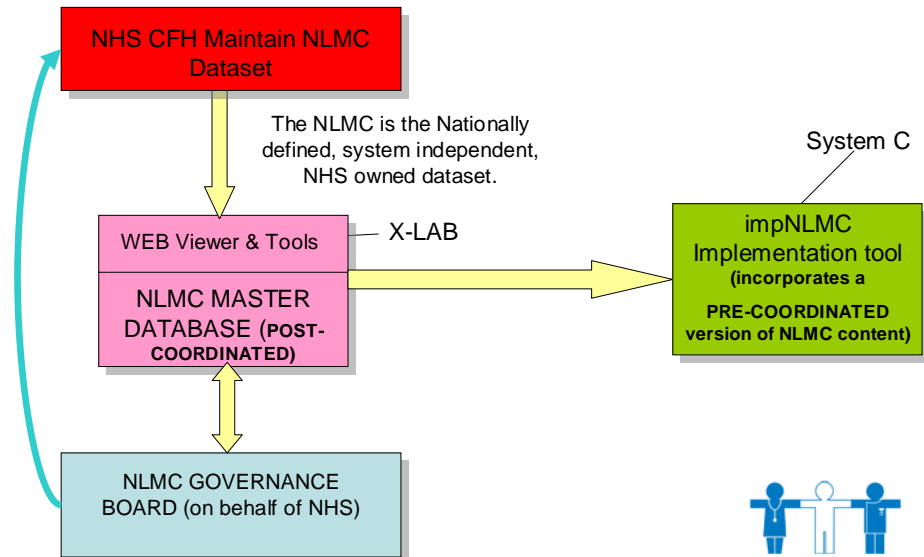
The impNLMC (imp being an abbreviation of implementation)

- Nationally defined content
- Content quality assured by NHS consensus.
- Inherits all nationally defined content from the NLMC master database
- Large dataset which acts as a content starter pack to help fast track systems implementation.
- Larger content scope contains content related to results reporting as well as test requesting e.g. recommended units of measure
- Essentially a tool that informs systems configuration and implementation

The impNLMC is the database that local implementations of pathology order communications solutions will utilise to inform the system configuration.

The relationship between the NLMC and the impNLMC is shown below:

National Laboratory Medicine Catalogue (NLMC)



9.4.8 Post-coordinated NLMC, Pre-coordinated impNLMC

The NHS has chosen SNOMED CT as the standard nomenclature to code clinical information and is in the process of adapting its work practices and electronic systems to reflect this decision. There are two broad approaches to SNOMED CT coding of information referred to as pre-coordination and post-coordination, for definitions of these terms please see the glossary of terms in Appendix 2 or read the appropriate IHTSDO documentation:

<http://www.ihtsdo.org/snomed-ct/snomed-ct-publications/>

Both approaches have the same goal of naming things in a standard way as well as binding a unique SNOMED code, referred to as SNOMED CT concept ID, to informational elements such that they are identifiable as unique clinical concepts for the purposes of manipulation such as occurs during clinical audit or decision support.

In the context of pathology order communications typical informational elements related to requesting would include, but not be limited to, the test, request display name, the specimen type, the specimen topography, morphology and laterality.

What differs for the two coding approaches being discussed is the method by which the end goal is achieved. The two methods are not mutually exclusive but the method chosen does profoundly affect the way the order catalogue content is designed and presented to a clinician in the real world

In a post-coordinated approach an electronic request would be seen as a series of discrete informational elements for example the test request name and specimen type each of which would have their own associated and unique SNOMED CT concept ID. The required combination of these two discrete informational elements needed to place a valid request is manually chosen by the clinician at the time of requesting for example I want to request a “Sodium level” in “blood” as opposed to a “Sodium level” in “urine” In clinical systems this might be typically achieved by the

clinician first searching for and selecting the “Test request display name” followed by a similar exercise to select from a valid list of specimen types. In a post-coordinated approach the assignment of unique SNOMED CT concept ID to the request would not happen until after the order is signed at which time electronic functionality would use standard rendering algorithms to create a unique SNOMED CT concept ID for the request being placed which would then be bound to the request to uniquely identify it in the electronic clinical record. With a post-coordinated approach only one NLMC test request name is needed for “Sodium level”

Now consider the same example using a pre-coordinated approach to SNOMED CT binding. In the pre-coordinated approach a unique static SNOMED CT concept ID is pre-assigned to each request item in the catalogue. The only way this can be achievable is if the test request display name describes the order in sufficient detail to allow the request to be uniquely identified. This approach has the advantage that the clinician does not need to separately select a valid specimen type when placing a request because the pre-coordinated test request display name would be: “Sodium level, blood” as an example. The downside of such an approach is that now a “sodium level” in the order catalogue is represented by multiple orders and test request display names get larger and more complex

e.g.

Sodium level, blood

Sodium level, urine

Sodium level, faeces

Sodium level, CSF

etc

whereas in the post coordinated approach only one entry is required for the test request display name i.e. “Sodium level”

So the pre-coordinated approach results in the order catalogue dramatically increasing in size making it difficult to manage and maintain. For more complex orders where combinations of topography, laterality and morphology may be involved a pre-coordinated approach would not be feasible or sustainable in terms of the number of orderable items it generates or the usability of the front-end clinician interface needed to support the presentation of such a catalogue.

The current situation (April 2009) is this

1. Existing clinical systems show a range regarding the degree of support for SNOMED CT coding from none at all to adequate.
2. There are currently no rendering algorithms defined to allow post-coordinated generation of SNOMED CT concept IDs for electronic requests, consequently there are no electronic clinical systems that support this approach.
3. There are several systems that do support a pre-coordinated design approach to SNOMED CT binding

So the NLMC dataset is designed to support a standards based approach, aligned with the modernisation aspirations of the NHS which currently cannot be technically fully realised in real world systems. This is perfectly valid on the basis that eventually supplier support for post-coordination will become available but in the

interim it does create some challenges when transferring nationally standardised core data between the post-coordinated NLMC and the pre-coordinated impNLMC