Guidance for Primary Care: Transitioning from Read to SNOMED CT

Version 1
Published December 2016
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1. Introduction

Read codes were first used in GP systems in 1985, since then technology and IT systems have evolved significantly. Demand for new terms has outgrown their simple hierarchical structure and the simple design cannot support future requirements of the EHR (Electronic Healthcare Record).

There are known issues with the Read codes which cannot be resolved: these include incorrect content, no room in the correct place for some new content, and ideally needing more than 5 characters to correctly reflect some content. Read codes also cannot be expanded to meet the requirements across all of healthcare and they are UK only, which is an issue for international work in for example rare diseases and genomics.

Models of healthcare are increasingly dependent on sharing data across domains and thus a common terminology is vital to their future success. For EHR systems to support future healthcare in a meaningful way, such as sophisticated patient alerts, clinical decision support tools and meaningful analysis of data, then a modern terminology is required.

Significant consultation with the Joint GP IT Committee (the BMA and RCGP) and the various clinical bodies (e.g. AoMRC, AHPs, RCN, RCP) has resulted in agreement that it is now critical to transition from the Read codes to SNOMED CT.

To support General Practice in that transition, this document provides some insight into differences in the Clinical Terms that are available in SNOMED CT and those in Read.

The document is organised in Sections; Section 3 provides a summary of the major differences that will be encountered. The other sections provide an overview of SNOMED CT and further explanation of the items in Section 3. This document will be updated over the next two years as transition to SNOMED CT progresses.
2. Overview

Note. Additional quality assurance work in mapping Read codes to SNOMED CT is currently under way. This document will be updated with any further information that arises from that process sometime in April 2017.

Purpose of this document

This document is to support those impacted by the transition from Read to SNOMED CT as the method for data entry into electronic health records. It provides an overview of differences in term descriptions and organisation of hierarchies.

It is generally known that some Read code content is actually considered ‘wrong’; it follows that at least some of the terms currently available in Read will no longer be available in SNOMED CT. This document highlights such differences so that users of General Practice (GP) systems are aware and understand how to deal with such changes.

As part of the development work for the transition to SNOMED CT, significant analysis has been undertaken on the Read codes GPs actually use; issues highlighted as part of this analysis will also be covered.

Audience

This document is aimed at users in general practice who enter data using Read Terms and Codes into electronic record systems. This includes general practitioners, nurses and clinical coding staff as well as those involved in training others and those who produce business rules, decisions support tools or analyse Read coded data. In particular those who have responsibility for record quality in general practice should read this document.

Scope

This document addresses the clinical content of the Read codes; it does not address aspects in relation to medications.

This document is NOT a guide to coding in Read or more generally to good record-keeping, however it does provide some hints and tips for good SNOMED CT coding in areas that have been more ambiguous in Read.

The Good Practice Guidelines for GP electronic patient records provides overarching principles for data entry.

Feedback

The authors welcome feedback on the content of this document, including any items perceived to be missing. Please provide comments by email to snomedprimarycare@nhs.net.
3. Summary

This section provides an overview of differences between Read and SNOMED CT; subsequent sections provide associated explanations as well as highlighting some current data known quality issues. Readers may find the IHTSDO Glossary useful for SNOMED CT.

- Read codes are 5 characters in length; SNOMED CT codes are between 6 and 18 digits long – it is not expected anyone will remember the codes.
- Indication of the type of term can generally be inferred from the actual code in Read v2, this is not true in SNOMED CT – the codes are meaningless. In SNOMED CT the type of term (for example a procedure) is indicated by the hierarchy and the concept’s Fully Specified Name (FSN).
- Read v2 codes can only have one parent code; this is often clinically not the case and has led to duplicates in Read. Concepts in SNOMED CT can have multiple parents.
- The hierarchies in Read v2 can only be to 5 levels deep; in SNOMED CT there is no such limit.
- Incorrect codes and terms cannot be deleted in Read v2; in SNOMED CT outdated concepts and changes in clinical requirements can be addressed.
- Terms ending in NEC/NOS (Not Elsewhere Classified and Not Otherwise Specified) are not available in SNOMED CT; the term description minus the NEC/NOS is generally available. For example: Otitis media not Otitis media NOS
- The abbreviated terms in Read are not used in SNOMED CT, however all known browsers/code pickers will search on the beginnings of words so the abbreviated form can still be used in searching although the full description will appear in the record. For example: Cerv.smear.severe dysk.?inv.ca in SNOMED CT is Severe dyskaryosis on cervical smear cannot exclude invasive carcinoma and can be searched for say by entering Cerv smear sev dysk inv ca
- Duplicate terms in Read have been resolved to a single concept in SNOMED CT. For example: Tuberculous meningitis and Meningitis – tuberculous are tuberculous meningitis in SNOMED CT.
- Word order may differ – SNOMED CT has defined editorial principles to encourage consistency of expression of descriptions. For example: Naso-lacrimal duct probing is Probing of nasolacrimal duct in SNOMED CT. Note: all known browsers will search correctly independently of word order of the search terms.
- Plurals are discouraged – always search for the singular.
- Spelling errors have in the main been corrected.
- Outdated terms have been removed, for example Insulin dependent diabetes mellitus.
- Codes beginning [X] exist as the same description without the [X].
- Codes beginning [SO] exist as the same description without the [SO].
- Codes beginning [M] exist as the same description without the [M].
- Synonyms in SNOMED CT are true synonyms – i.e. they are a different way of expressing the same conceptual thought.
• Codes for NOT this condition, for example Not Constipated sit elsewhere in the hierarchy in SNOMED CT and are NOT children of (in this example) Constipated.

Hints and Tips

This section provides some hints and tips to help users find the terms they wish to select in SNOMED CT:

• In general, terms are represented in the singular rather than the plural. Always search for the singular version of a description.

• A hyphen is a punctuation mark used to join words and to separate syllables. There should be no spaces either before or after the hyphen e.g. intra-articular.

• Names that are derived from a proper name e.g. Down Syndrome, should avoid apostrophes wherever possible, although a synonym with the apostrophe may also be available.

• When searching for terms, do not enter non-significant words such as “of”, “the” etc. unless you know the exact term from say a guidance document.

• Searches in systems have evolved and can use the words entered in any order, so don’t worry about getting the significant words in the right order when searching for something new.

• Searches in systems do not usually need full words to be entered, Entering only the beginning (for example the first 4 characters) of two or three words from your required description is usually enough to get back a relatively small list of possible matches. You don’t need to know or type in full the exact wording for the clinical concept you need. Entering more letters and words will typically reduce the number of search results returned. If it’s a term you use frequently, you start to recognise how many letters are required to get a good search result.

• If possible, look at the ancestors and descendants that your term choice has in the SNOMED CT hierarchy. It should be obvious from these if you’ve actually picked a concept whose meaning is completely different from what you intended.

It is recommended that in addition to this section, as a minimum, you also read Section 6 on known Data Quality Issues.
4. The Transition to SNOMED CT

Mapping Read data to SNOMED CT

All system suppliers are required to use national mapping tables produced by the UK Terminology Centre (UKTC) to allocate an appropriate SNOMED CT code to each Read term already in patient records. This ensures we have a consistent approach across the different GP systems for deriving the resultant SNOMED CT code for every Read code.

A “map” in this context means a link between the term in Read and an equivalent description in SNOMED CT. The mapping tables have been produced through a combination of automatic mapping technologies, backed up by selective manual checking. In very many cases the term text the user sees in SNOMED CT will be identical to the term text you see now in Read.

These mapping tables are available free from the UKTC distribution site (known as TRUD) to anyone who is supporting or delivering healthcare solutions in the UK. The pack containing the mapping tables is NHS Data Migration; the tables are simply ‘tab’ delimited files. They’ve already been used extensively for the last 6 years to support all exchanges of individual patient records Read2 and CTV3 systems under GP2GP, and from all practices in England to the Summary Care Record.

The mapping tables have been produced by clinical and terminology experts in collaboration with the Joint GP IT Committee (JGPITC). An expert reference group (ERG) formed from the JGPITC has re-examined both the methodology as well as a significant number of the actual maps. Documentation providing details on the maps and their use is available as part of the set of files obtained when you download the mapping tables from TRUD.

SNOMED CT content

Editorial ‘rules’

Creation of new content in SNOMED CT is governed by documented Editorial Principles; these are maintained at an international level and extended by the UK where necessary for UK specific content. SNOMED clinical terms are designed to be unambiguous, expressed in a consistent and predictable way, and terms are developed with the knowledge that content is being shared across different professions and different care settings, so needs to be interpreted correctly in all settings.

For this reason, some Read terms added in the past would not be added to SNOMED CT.

Context

Every term in SNOMED CT carries a “soft-default” context, which means that, unless stated otherwise, the concept carries an implicit basic understanding:

For a clinical finding this is that:

• it is occurring to the subject of record (the patient, not their relative)
• it is actually occurring (vs. being absent or not found)
• it is occurring now (not in the past, or possibly in the future) although in GP systems this may be the event date where data is entered retrospectively
For a Procedure this means that:

- the procedure was completed (not scheduled, or abandoned)
- it was performed on the subject of record (the patient, not their relative)
- it was done on the date of the record entry (not at some prior or future time)

Obvious exceptions to this are a special group of concepts whose description already clearly contains a specific and different context e.g. “father smokes” or “maternal history of breast cancer” or “arthroscopy planned”. Such concepts are all grouped in a special hierarchy (“Situation with explicit context”).

**Reducing Ambiguity**

SNOMED CT is based on Clinical Concepts; one of the fundamental principles of SNOMED CT is to reduce ambiguity in the meaning of these clinical concepts by the way it provides descriptions of a concept. Each concept has a number of text “Descriptions” that describe that concept; conceptually all the descriptions mean the same but some are more precise than others. Each concept will have at least one unambiguous description. Each clinical concept has an ID which is a 6 to 18 digit number, all the descriptions of the same concept have the same concept id.

However, sometimes the precise meaning of a concept cannot always be determined by reading just one of its descriptions. For example, the term “dressing” applies equally to the actual covering that you place on a wound, the act of applying one, or the ability to put on your own clothes. Selecting the correct underlying meaning is clearly important for other clinicians who read the descriptions in the record but they can often deduce this from say free text; however it is critical for computers executing code-driven analysis, reporting or decision support.

These Descriptions are known as Synonyms and aid in finding the correct concept to enter into a record. Some synonyms are ambiguous such as “dressing” but others more clearly express the clinical concept. Crucially, each concept will always have exactly one ‘fully specified name’ (FSN) which should be unambiguous. The FSN will contain a ‘semantic tag’ in parenthesis, which identifies the location of the concept in the SNOMED CT hierarchy. For the synonyms of “dressing”, one has the FSN “Medical dressing (physical object)” and identifies the concept corresponding to the dressing itself, another synonym is for the concept with a FSN “Application of dressing (procedure)”. So if selecting dressing it is important to select the one which belongs to the correct concept.

Different systems will help users choose the correct description to add in different ways; some may show the hierarchy in which the concept referred to by the description sits or may show the FSN on say hovering over the Synonym. The true meaning of a concept is often made obvious by looking at its parent and child concepts. This is akin to checking that the Read code being selected is in the correct Chapter.

You should know how to use your particular system to check a description really means what you intend it to mean.
5. Differences in term text between Read and SNOMED CT

This section highlights how some common types of terms have been mapped where the text in SNOMED CT differs from that in the Read codes. The differences are generally to remove some of the anomalies in Read that have arisen from their historical beginnings.

Terms ending in NOS / NEC

Terms available in Read ending in NOS (not otherwise specified), NEC (not elsewhere classified) or HFQ (however further qualified) and those beginning Other specified originated from the classifications (ICD and OPCS). The meanings intended by these pre- and postfixes are very specific: they’re also unique to one particular version of the classifications they come from, which are typically static for a period of time with new codes added only every few years. These codes serve as ‘catch-alls’ for conditions that lack a dedicated code in the specific version of the classification. But if a dedicated code for the condition is added to a later version of the same classification, then the meaning of the catch-all term and its code changes: it no longer ‘catches’ the condition for which the code was added. Such descriptions do not exist in SNOMED CT.

SNOMED CT changes every 6 months; SNOMED CT therefore cannot preserve the specific meaning each catch-all term had at some point in time, or the way the meaning changed as new codes were added to the classification. ‘Catch all’ terms therefore can have no clearly defined meaning within a terminology that provides the vocabulary for providing the necessary detail in patient records.

In the mapping from Read to SNOMED CT, these terms are therefore mapped to a SNOMED CT synonym with the same text but without the NOS/NEC/HFQ/Other specified, or in the case of some typically very general codes, to text which is different but still reflects the same general meaning.

Examples:
- F52z. 00 Otitis media NOS maps to 65363002 Otitis media
- Q4z.. 15 Stillbirth NEC maps to 237364002 Stillbirth
- 77216 00 Perineal resection of rectum HFQ maps to 87677003 Resection of rectum
- 721By 00 Other specified other operation on eyelid maps to 40654000 Operation on eyelid
- Nyu97 00 [X]Synovial hypertrophy, not elsewhere classified maps to 240206002 Synovial hypertrophy
- 71244 00 Biopsy of lesion of adrenal gland NEC maps to 172033008 Biopsy of lesion of adrenal gland
- 7NB5y 00 [SO]Other specified other veins of pelvis NEC maps to 13152008 Structure of pelvic vein
- 7A5z. 00 Other artery operations NOS maps to 118805000 Procedure on artery
- 7P16y 00 Other specified other diagnostic tests on skin maps to 53309004 Skin test
Abbreviations

Because of the term length restrictions inherent to READ v2, some of its terms were abbreviated. By contrast, the aim to avoid ambiguity in SNOMED CT means that such Descriptions do not exist in SNOMED CT. The requirement on all system suppliers is to accommodate these longer descriptions in their system design. These abbreviated terms are mapped to an unabbreviated equivalent.

Examples:

2691. 00 O/E-vaginal speculum exam. NAD maps to 163413007 On examination - vaginal speculum examination - no abnormality detected

24F8. 00 O/E - L.dorsalis pedis present maps to 163120009 On examination - left dorsalis pedis pulse present

429.. 00 Mean corpusc. Hb. conc. (MCHC) maps to 1022481000000109 MCHC - Mean corpuscular haemoglobin concentration

1241. 00 FH: * - gastrointestinal tract maps to 429006005 Family history of malignant neoplasm of gastrointestinal tract

4K25. 00 Cerv.smear:severe dysk.?inv.ca maps to 168406009 Severe dyskaryosis on cervical smear cannot exclude invasive carcinoma

12N1. 00 FH: Brother alive + well maps to 160445003 FH: Brother alive and well

Most common clinical abbreviations do exist in SNOMED CT, and can be used to search for terms. They generally are a synonym and the full expansion of the abbreviation will normally appear after the abbreviation within the same Description. For example, you won't find a synonym saying just “COPD”, you will see: COPD - Chronic obstructive pulmonary disease. This is because some abbreviations are used in different specialties with different meanings; for example PID may mean pelvic inflammatory disease OR prolapsed intervertebral disc. RTA can be renal tubular acidosis OR road traffic accident. SNOMED's more conservative treatment of abbreviations ensures that if data is electronically shared with another system then the correct meaning is not lost or misinterpreted.

Duplicate Terms

There are a number of terms that are in Read twice; sometimes by mistake (we now have sophisticated software to check for duplicates at the authoring stage) or because it could be categorized in more than one way and so was placed in all possible appropriate locations. This means two Read codes may legitimately map to the same SNOMED CT Concept, but the SNOMED Description may have slightly different wording to the original Read terms.

For example:

A130. Tuberculous meningitis (F004. Meningitis – tuberculous)

8764. Nebuliser therapy (74592 Nebuliser therapy)

65A. Measles vaccination (65A1. Measles vaccination)
Are both mapped to the single SNOMED CT term **measles vaccination**

F583. 00 Tinnitus  1C2.. 00 Tinnitus symptoms  F583z 00 Tinnitus NOS

Are all mapped to the single SNOMED CT term **101130017 Tinnitus**

H17.. 00 Allergic rhinitis  H17.. 12 Allergic rhinosinusitis  H171. 00 Allergic rhinitis due to other allergens  H172. 00 Allergic rhinitis due to unspecified allergen  H17z. 00 Allergic rhinitis NOS  Hyu21 00 [X]Other allergic rhinitis

Are all mapped to the single SNOMED CT term **102311013 Allergic rhinitis**

**Word Order**

As described earlier, SNOMED CT has clear editorial principles which make it clear how to form the text descriptions. This means that descriptions in SNOMED CT are often more consistently constructed than was the case early on in the Read codes. As a result the word order of a term may have changed slightly and/or the use of additional symbols such as hyphens.

Examples

533.. 00 Soft tissue X-ray neck maps to 168719007 Neck soft tissue X-ray

3712. 00 Naso-lacrimal duct probing maps to 90246009 Probing of nasolacrimal duct

**Plural nouns**

SNOMED CT editorial rules on term construction discourage the use of plural nouns, whereas Read editorial rules did not. This difference may be reflected in the mapping:

01... 00 Top managers maps to 265911003 Top manager

19F.. 12 Loose stools maps to 398032003 Loose stool

1B8.. 00 Eye symptoms maps to 308923001 Eye symptom

**Spelling errors**

Read v2 had no mechanism to enable errors to be corrected while still retaining the original text entered by the clinician; SNOMED CT has the ability to do this. As part of the mapping, and with clinical oversight, terms have been mapped to the now corrected descriptions in SNOMED CT.

Examples

028.. 00 Personnel/industrial relations maps to 265919001 Personnel/industrial relations

**Outdated Terms**

As clinical understanding develops and culture evolves, terms can become outdated. SNOMED CT enables new descriptions to be added to a concept while still retaining the more outdated descriptions. This enables clinical staff to select the term they wish to record, but the system to correctly recognise they conceptually mean the same thing. Over time and
with appropriate clinical guidance we may then retire the outdated term (so that it is no longer added to new patient records) yet still retain the original term as selected in historical records.

For example:

Diabetes mellitus is now described by whether it is type 1 or type 2 rather than the older convention of describing as Insulin or Non-Insulin dependent. Data entry should use terms with type 1 or type 2 for diabetes mellitus in Read v2 and the older Read v2 terms are no longer available in SNOMED CT.

**C10E. | Type 1 diabetes mellitus** (Version 2) **X40J4 | Type I diabetes mellitus** (CTV3)

**C10F. | Type 2 diabetes mellitus** (Version 2) **X40J5 | Type II diabetes mellitus** (CTV3)

**Rather than**

**C108. | Insulin dependent diabetes mellitus** (Version 2)

**C109. | Non-insulin dependent diabetes mellitus** (Version 2)

The mapping tables address these, for example:

**C10E. 12 Insulin dependent diabetes mellitus** maps to **46635009 Type 1 diabetes mellitus**

Another example is:

**C03.. 11 Cretinism** which maps to **190268003 Congenital hypothyroidism**

**Terms beginning [X]**

[X] originally indicated that the term had an equivalent code in ICD-10. These terms therefore map to the equivalent term in SNOMED CT but with the [X] omitted from the description. Very few terms prefixed with [X] are still available in SNOMED CT, and these are in the process of being retired from SNOMED CT and should not be used. The mapping tables also address these.

For example:

**A548. 00 [X] Herpes labialis** maps to **1475003 Herpes labialis**

**Eu32. 00 [X]Depressive episode** maps to **35489007 Depressive disorder**

**Eu41z 11 [X]Anxiety NOS** maps to **197480006 Anxiety disorder**

**Eu01. 00 [X]Vascular dementia** maps to **56267009 VAD - Vascular dementia**

**Terms beginning [SO]**

It is questionable as to whether these terms are needed in General Practice (see next section). These are a list of anatomical sites from the OPCS system for coding related to surgical procedures. A general procedure code from OPCS can be annotated with an anatomical site code to allow more precision about what structure was operated upon. Recording only a [SO] site code without an accompanying main procedure code is therefore meaningless …although we know some GP records mistakenly contain instances of this, for example **7N89. [SO] Lymph node** instead of **2C3.. 00 O/E – lymphadenopathy** or possibly **7H62. Excision or biopsy of lymph node**; and **7N310 [SO] Appendix instead of Appendicectomy**.
These [SO] terms map to the equivalent anatomical term in SNOMED CT but with the [SO] omitted. Within SNOMED CT these terms are within the SNOMED CT hierarchy ‘body structure’ so their meaning is clear without the [SO] as part of the description text.

7N890 00 [SO]Cervical lymph node maps to 81105003 Cervical lymph node structure
7N89. 00 [SO]Lymph node maps to 59441001 Structure of lymph node
7N8.. 00 [SO]Soft tissue maps to 87784001 Soft tissues
7NAD1 00 [SO]Acromioclavicular joint maps to 85856004 Acromioclavicular joint structure

**Terms beginning [M]**

The [M] prefix in a Read term indicates that it originates via ICD but ultimately as a morphology term from ICD-O. Within ICD-O cancer diagnoses should be recorded as a pair of codes: a morphology code stating the histopathological tumour type, and a site code stating that anatomical location. SNOMED CT closely mirrors content in ICD-O and offers specific and extensive separate hierarchies for morphologies and body structures; it does not use the [M] prefix to indicate the morphology elements. Read’s [M] terms are therefore generally available in SNOMED using the same text but excluding an [M] prefix, though note that most of the SNOMED codes involved are therefore not reportable as disorders – they’re histopathological morphologies, not considered a diagnosis in themselves unless and until also linked to a specific anatomical site.

In SNOMED CT these concepts can be found under the concept of neoplasm and are in the body structure hierarchy within morphologic abnormality.

**Note** that this is also the case in Read codes and cancers should not be recorded only with a [M] code. Exceptions in SNOMED typically include [M] terms that already also imply a particular body site:

BB13. 00 [M]Carcinoma, metastatic, NOS maps to 79282002 Carcinoma, metastatic (morphologic abnormality)
BBEJ. 00 [M]Intradermal naevus maps to 112681002 Intradermal naevus (morphologic abnormality)
BBg1. 11 [M]Lymphoma NOS maps to 21964009 Malignant lymphoma (morphologic abnormality)

But:
BBK00 11 [M]Fibroid uterus maps to 95315005 Fibroid uterus (disorder)
6. Known data quality issues in Read coding choices

As a general rule, when deciding which term to select:

- use the one that is completely true and closest to what you would want to say;
- be consistent across patients;
- ensure that the term refers to the correct concept type e.g. a procedure, a clinical finding, an assessment tool.

For example, don’t put in:

- salmonella (organism) when you mean salmonella gastroenteritis (disorder)
- lymph node (body structure) when you mean lymphadenopathy (disorder)
- alcohol (substance) when you mean alcohol abuse (disorder).

The following gives examples of known recording issues; these examples are by no means exhaustive:

**Occupation Terms**

Occupation terms (e.g. Read codes with first character 0) state that the patient themselves has a certain occupation. These should be avoided for recording any referral to or by a healthcare professional.

For example: Nurse (meaning the patient is a nurse) is often used instead of Referral to nurse.

- **03I1. | Optometrist** (Both Version 2 and CTV3) means the patient is an Optometrist
- **03G2. | Retail pharmacist** (Both Version 2 and CTV3) means the patient is a Retail Pharmacist.

**The correct terms to use for a referral are:**

- **8HlC. | Referral to optometrist** (Read v2)
- **XaBTJ | Referral to optometrist** (CTV3)
- **8H7t. | Referral to pharmacist** (Both Version 2 and CTV3)

**7M... | Subsidiary classification of methods of operation**

Terms with Read codes starting 7M - ‘Subsidiary classification of methods of operation’ are also derived from OPCS, and provide terms to more precisely record aspects of the surgical technique used to perform an accompanying main procedure code. They should therefore be avoided in general practice unless required for a particular clinical reason such as being judged to be of special relevance to future care.

Examples:

- **7M34. 00 Local anaesthetic** maps to 386761002 Local anaesthetic
- **7M07z 11 Cryotherapy** maps to 257786008 Cryotherapy
- **7M371 00 Radiotherapy NEC** maps to 53438000 Radiation therapy procedure or service
7Q... | Drugs

Terms with Read codes starting 7Q - ‘Drugs’ (Read v2) or that sit under XaM5Z | High cost drugs in CTV3 should not be used. They also derive from OPCS, in which a main procedure code may be accompanied by another code to record when the procedure involved using an expensive drug. In a primary care setting, these codes should not be used in isolation:

Examples known to be currently used in Primary care data:

- 7Q... 00 Drugs maps to 228011000000101 Drugs (which does NOT mean drug abuse)
- 7Q096 00 Total parenteral nutrition maps to 225372007 Total parenteral nutrition
- 7Q0J0 00 Cancer hormonal treatment drugs Band 1 maps to 897671000000103 Cancer hormonal treatment drugs Band 1

Read Code Administration terms

‘Read Code Administration’ terms - Read codes starting characters 1z - exist purely so that system suppliers may monitor their processes by which each new version of the READ code list is deployed to practices (the codes serve to ‘date stamp’ each release version).

For example:

- 1z... 00 Read Code Administration maps to 716481000000102 Read code administration (record artifact)
- 1zz.. 00 Read Code Administration maps to 716481000000102 Read code administration (record artifact)
- 1zz0. 00 Read Code Administration maps to 716481000000102 Read code administration (record artifact)
- 1zz06 00 Quarter 1 1993 SPLENDID maps to 716481000000102 Read code administration
- 1zz07 00 Quarter 2 1993 EXPANDED maps to 716481000000102 Read code administration

These terms should not be entered into the patient record. SNOMED CT has a different method of identifying the particular release and so these terms will all map to the same SNOMED CT concept which indicates it is a Read code administration term.

Mental Disorder terms

The terms under [E0...], [E1...], [E2...], [E3...] are derived from ICD-9 whereas terms under [Eu...] are prefixed by [X], which means that the term has an equivalent code in ICD-10 and should be used in preference. Equivalent terms for those under [EU...] exist in SNOMED CT, however the ‘[X]’ prefix is omitted.

‘Grouper Terms’ that don’t mean what you think

An example of this phenomenon in Read v2 is 19C.. Constipation. Clinicians using this code very likely think they’re recording that the patient was constipated, however it is in effect a ‘heading’ for all codes that state something in relation to constipation – including NOT constipated. The Read v2 code [19C2.] Constipated should be used:

- 19... Gastrointestinal symptoms
- 19C.. Constipation
19C1. Not constipated
19C2. Constipated
19CZ. Constipation NOS

Whilst [19C2. Constipated] is also used in general practice, it accounts for only about 1/10th as many new EPR entries as [19C.. Constipation].

From a reporting point of view, therefore, a request to retrieve all patients with [19C..] or any of its subtypes will in fact return all patients on record with constipation as well as those noted to not have constipation.

A similar common case of ‘groupers’ code (mis)use concerns the procedure term 7L17. Blood withdrawal. This has a number of more specific children that includes 7L172 Blood withdrawal for testing but also 7L171 Venesection (typically removing a pint or more for therapeutic reasons, and so not taking a blood specimen for testing), 7L170 Blood donation and even 7L177 Unsuccessful phlebotomy. The parent term 7L17. Blood withdrawal should therefore be avoided for data entry because, in a reporting context, it would not return only patients who had had a blood sample taken for testing (the meaning most likely intended when it is misused).

Similarly, the Read term 61.. Contraception is a grouper term and the more specific codes should be used:

For example (not exhaustive):

- 6147. Combined oral contraceptive
- 6144. Oral contraceptive repeat
- 6148. Progestagen only oral contrac.
- 614E. Oral contraceptive advice
- 614D. Oral contraceptive prescribed

This approach is NOT used in SNOMED CT, and so all children of say constipation are a type of constipation and may be used for data entry.

Note. SNOMED CT also contains high level grouper terms, for example ‘Disorder of ear’. These should be avoided in data entry when wishing to describe a more specific condition, as they clearly convey very little specific clinical information.

Causes of injury and poisoning terms

The terms under chapter T (codes beginning [T...]) were derived from ICD-9 and added to the Read code set in the late 1980s. They were superseded in the early 1990s by terms under [U...] covering substantially the same clinical territory but derived from (and hierarchically organised according to) ICD10. Although the intention was that only the ICD10 derived codes should be used when required, codes cannot be retired in Read v2, so elements from both code sets remain widely used by today’s GPs:

- T1... 00 Motor vehicle traffic accidents (MVTA)
- U0... 12 [X]RTA - Road traffic and other transport accidents
- TE60. 00 Dog bite
- U124. 11 [X]Bite from dog
U6000 14 [X] Adverse reaction to flucloxacillin
TJ002 00 Adverse reaction to flucloxacillin
TJ00. 00 Adverse reaction to penicillins
U6000 11 [X] Adverse reaction to penicillins
U6000 1J [X] Adverse reaction to penicillin NOS

In SNOMED CT, such descriptions are only in once and with the [X] omitted. For example adverse reaction to penicillins is a concept description within SNOMED CT.

Chapter Z codes

The 1706 Read terms under chapter Z (codes under [Z….]) are further divided between those with a prefix [V] under ZV…, [V]Factors influencing health status and contact with health services and those with a prefix [Q] under Zw..., [Q] Temporary qualifying terms. Both are derived from ICD9. They should consequently be avoided in data entry for primary care and their equivalent elsewhere in Read should be used:

- ZV708 00 [V] Routine child health examination
- ZV583 12 [V] Removal of sutures use instead 7G22. 12 Removal of suture from skin
- ZV57C 00 [V] Palliative care
- ZV681 00 [V] Issue of repeat prescription use instead 8B41. 00 Repeated prescription
- ZV680 00 [V] Issue of medical certificate use instead 9DB2. Misc. cert completed

And/Or Terms

Terms that have words and/or in for example H141.Tonsil and/or adenoid hypertrophy should not be used as they are ambiguous terms and were originally developed simply as groupers to categorise more specific unambiguous terms below them in the hierarchy. While some of these do still exist in SNOMED CT they are slowly being inactivated as the content in SNOMED CT is improved.

‘Referral to clinic A’ type terms

At some point in the early 1990s, four parallel sets of clinic administration codes were added to the Read chapter 9 for administrative codes, under the following groupers:

- 9OS.. Clinic 'A' monitoring admin.
- 9OT.. Clinic 'B' monitoring admin.
- 9OU.. Clinic 'C' monitoring admin.
- 9OV.. Clinic 'D' monitoring admin.

In full, the Clinic A set looks like this (the lists for Clinics B, C and D are similar):

- 9OS.. Clinic 'A' monitoring admin.
  - 9OS1.. Attends clinic A monitoring
  - 9OS2.. Refuses clinic A monitoring
  - 9OS3.. Clinic A monitoring default
  - 9OS4.. Clinic A monitoring 1st letter
  - 9OS5.. Clinic A monitoring 2nd letter
Collectively, these Clinic A/B/C/D codes are currently being used in the UK only in relatively small but steadily increasing volumes (approx. 250,000 new EPR items annually in 2014-15, but double the volume of 3 years previously).

Use of these terms remained acceptable and clinically safe only whilst data was not being shared across different systems and clinical care settings. However, in a paperless interoperable healthcare environment, these terms are unhelpful at best and dangerous at worst: real EPR data reveals that one practice’s 9OSA. Clinic A monitoring check done is another practice’s 8B3l. Diabetes medication review and yet another’s 662d. Hypertension annual review.

Because of this very obvious ambiguity, SNOMED CT does not offer equivalent terms in the expectation that only unambiguously specific clinic type administrative terms will be used in future. As part of the transition to SNOMED CT the existing Clinic A/B/C/D codes will still be mapped, and so will continue to be available for reporting over historically captured data. But they will be mapped to inactive terms within SNOMED CT and so should not remain available for new data entry. Receiving systems will additionally be alerted to these historical terms within inbound data so that clinicians can decide locally what action should be taken e.g. with respect to which local monitoring clinics the patient may need to be correctly invited to attend.

**Symptoms, signs and ill-defined conditions terms**

The Read terms in Chapter R are defined as ‘Symptoms, signs and ill-defined conditions’. Like all codes in Read that begin with a letter, these terms and their hierarchical arrangement are derived from ICD9. The original World Health Organisation primary use case for Chapter R was to allow a reason for consultation (or cause of death) to be recorded by reference to symptomatology alone. This was particular useful in remote care settings where lack of diagnostic facilities did not permit a pathophysiological diagnosis.

General practices should therefore avoid using these terms as they are often vague and non-specific:

- 378th R021. 00 [D]Rash and other nonspecific skin eruption
- 766th R065A 00 [D]Musculoskeletal chest pain
- 912th R1y2. 00 [D]Raised blood pressure reading
- 1049th R090. 00 [D]Abdominal pain
- 1063rd R01z2 00 [D]Musculoskeletal pain
- 1157th R062. 00 [D]Cough

Additionally, when trying to find the best Read term for a symptom, disease or disorder the other primary disorder chapters are more appropriate and a more comprehensive set of symptoms and signs terms are available in Chapters 1 and 2. Thus, with a few notable exceptions, most of Chapter R serves only to duplicate terms also available (and more appropriately from a reporting point of view) elsewhere in Read.
It has previously been argued that the Chapter R codes have a legitimate place in UK general practice in order to handle patients with recurrent and distressing symptoms, for which an underlying diagnosis cannot be established. The symptom *is* the disorder. So, for example, isolated or sporadically occurring chest or abdominal pain, or currently unexplained recurrent pain but for which investigation is not yet complete, should be coded using the Chapter 1 terms of 182. [D]Chest pain or 197C. Lower abdominal pain. However, once extensive investigation has failed to find a cause of their symptoms, the same patients might only then be appropriately also coded using the terms R065. [D]Chest pain or R090. [D]Abdominal pain.

Whilst this is an interesting distinction to make, there is limited evidence of its clinical utility and much evidence that few clinicians do reliably make that distinction.
7. Considerations for Queries

This section highlights the main differences to be considered in relation to writing queries, whether it be for reports, business rules or data extraction.

Present and not present

Within Read v2 some codes exist that serve only to gather together codes related to the same clinical area so that they’re easier to find when using the hierarchy to pick a code for data entry. Therefore, they often gather together codes to record both when a given phenomenon is ‘present’ and when it is ‘not present’. This is NOT the case in SNOMED CT; codes where the symptom or condition is absent do exist in SNOMED but in a completely separate hierarchy ‘clinical finding absent’. As software systems mature, the ‘not present’ aspect of negative findings may move to being captured using a completely different approach, entirely outside SNOMED CT.

The 19C.. Constipation example in the earlier ‘Grouper terms that don’t mean what you think’ section illustrates the point and specific reporting problem further.

Further celebrated examples include the terms 198.. | Nausea; 199.. | Vomiting; 19F.. | Diarrhoea symptoms. They have all been used extremely frequently, but all meaning (strictly) ‘the patient may or may not have nausea/vomiting/diarrhoea’ and so probably not what the recording clinician intended.

In mapping such ‘present/absent’ type content to SNOMED, however, the ‘present’ and ‘not present’ flavours will be mapped to their appropriate concept in SNOMED CT using the description text, but they’ll end up in very different hierarchical places in SNOMED CT. This means reporting in SNOMED CT can be done by searching for all patients with the term Constipation or any of its children, and you will no longer also get patients who definitely do not have constipation.

As a general principle, the term selected at the point of data entry should be fully accurate and as detailed as possible, so an accurate child concept if it exists is clinically more appropriate than a higher level concept.

Terms that should be children but are not

Some terms currently published in Read v2 should be classified under some existing level 5 term … but they cannot be because of the Read v2 hierarchy limit. Instead they have had to be represented used the fixed 5 character codes that Read v2 provides.

For example:

- C10E. Type 1 diabetes mellitus
  - C10E1 Type 1 diabetes mellitus with ophthalmic complications
  - C10EF Type 1 diabetes mellitus with diabetic cataract
  - C10E7 Type 1 diabetes mellitus with retinopathy
  - C10EP Type 1 diabetes mellitus with exudative maculopathy

The last three terms should all be children of the third: Type 1 diabetes mellitus with ophthalmic complications. SNOMED CT does not have this restriction.
Another example is:

71304  Subcutaneous mastectomy
71307  Subcutaneous mastectomy for gynaecomastia

The second term should be a hierarchical child of the first term but cannot be.

As well as not having more than 5 levels to the hierarchy, the Read v2 structure also imposes a maximum number of 62 children per concept. Where a term should have more than this number of children, the excess of children must instead be placed under some form of overflow term(s). For example, the many RAST allergy test terms in Read ended up spread across one primary grouper and 43Q.. RAST test plus four successive overflow groups 43Y.. Other RAST test, 43I.. Additional RAST test, 43I.. Further RAST tests and 43I.. Supplementary RAST tests.

This constraint does not exist in SNOMED CT and concepts are in the correct place within the hierarchy.

**Duplicate Terms**

Read v2 contains many duplicates; i.e. the same term repeated but in different places in the Read code set with a different code and different parents and children. This has usually occurred because the term could be categorised in more than one way, but the Read v2 structure does not permit this.

By contrast, both CTV3 and SNOMED CT provides for a single concept to be categorised in a number of ways thus having more than one parent. This means concepts need exist only once in these terminologies. This means that a number of Read v2 codes may map to a single SNOMED CT concept.

For example:

<table>
<thead>
<tr>
<th>1C13. 00 Deafness</th>
<th>66U.. 11 Hormone replacement therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>maps to 275879008 O/E - deaf</td>
<td>maps to 266717002 Hormone replacement therapy</td>
</tr>
<tr>
<td>F59.. 11 Deafness</td>
<td>8B64. 00 Hormone replacement therapy</td>
</tr>
<tr>
<td>maps to 275879008 O/E - deaf</td>
<td>maps to 266717002 Hormone replacement therapy</td>
</tr>
<tr>
<td>9877. 11 Injection given</td>
<td>N245. 13 Foot pain</td>
</tr>
<tr>
<td>maps to 275659002 Injection given</td>
<td>maps to 47933007 Foot pain</td>
</tr>
<tr>
<td>85D.. 00 Injection given</td>
<td>1M11. 00 Foot pain</td>
</tr>
<tr>
<td>maps to 275659002 Injection given</td>
<td>maps to 47933007 Foot pain</td>
</tr>
</tbody>
</table>

**Synonyms that are not synonyms**

Read v2 has always been quite liberal and heuristic in the way it organised terms; some terms are represented as synonyms even though they do not actually mean the same thing.

For example, the code 13JQ. Exempt from military service has the following as its synonyms:
[12] Non combatant  
[13] Refuses to bear arms  
[14] Medically unfit for service

N245. Pain in limb has these:

[12] Arm pain  
[13] Foot pain  
[14] Hand pain  
[15] Heel pain  
[16] Leg pain  
[17] Shoulder pain  
[18] Thigh pain  
[19] Pain in buttock

..and H330. Extrinsic (atopic) asthma has these:

[12] Childhood asthma  
[13] Hay fever with asthma  
[14] Pollen asthma

This approach was adopted partly because of the even more restricted hierarchies in the original 4 character version of Read and partly because it made certain population trends analyses easier to perform. Unfortunately, it makes other sorts of analyses (especially those for individual patient decision support) much harder.

This is not the case in SNOMED CT; here synonyms of the same concept strive to be truly only different ways of describing the same underlying clinical content. In mapping from Read to SNOMED CT therefore, terms have been mapped on their particular individual Read descriptions and thus different synonyms of the same Read code may map to completely different SNOMED concepts.