SNOMED GP IT Services Workshop
SNOMED CT in primary care

Denise Downs, Ian Spiers, Helen Beecroft
Welcome to SNOMED Training Workshop

Agenda
9.30 Registration
10.00 Welcome and Introductions
• Overview of SNOMED CT and practical
• Data quality considerations
• Approach: the transition
• Resources and supplier update
12.30 Lunch
• Searches and templates
• Coffee/tea
• Incorporating in data warehouses
16.00 Close
Housekeeping

• Toilets
• Fire
• Refreshments

• Introductions to NHSD team
Nothing will change

Don’t need to know anything about SNOMED CT

Things will greatly improve

I need to understand SNOMED CT
Year 2000 again ???

Hope for the best!

Plan for the worst
Overview of SNOMED CT
What is SNOMED CT?

• Read codes are being retired!
• A national common vocabulary of ‘Clinical phrases’ for electronic systems e.g. headache, asthma
• SNOMED CT has content for all healthcare professionals, all specialties for electronic patient records
• Will enable meaningful data exchange across care settings e.g. primary and secondary care
• dm+d (dictionary of medicines and devices) also uses SNOMED CT
Who ‘owns’ SNOMED CT

Member April 2016

- International content is managed by **SNOMED International** (not for profit organisation formally known as IHTSDO)

- Owned by National members, currently 30 member countries

- UK extension and release is managed by NHS Digital - UK Terminology and Classifications team

- Editorial Governance – ensures transparency in creation, retirement and changes to content
SNOMED CT Content

Clinical Findings
- Disease and deformity – scar
- Symptoms – difficulty breathing
- Social – walking aid use
- Examination findings – tachycardia

Causes of Disease
- Forces – pressure change
- Events – road traffic accident
- Organisms – herpes simplex virus

Procedures
- Laboratory
- Therapy
- Clinical investigation
- Surgical procedure
SNOMED CT Content

**Anatomy**
- Normal – knee joint
- Abnormal – ganglion cyst
- Lesions – bony callus

**Observations**
- Vital signs – blood pressure
- Body product observable – colour of urine
- Values - present

**Products**
- Drugs – paracetamol
- Substances – latex
- Devices – bedpan
Building blocks of SNOMED CT

- SNOMED CT has three key building blocks
  - concepts
  - descriptions
  - relationships
- Concepts are clinical ideas we wish to convey
- Descriptions are different ways of expressing a clinical idea
- Relationships tell us how the concepts link together and also provide more information about a concept
Concepts and Descriptions

Concept ID 22298006

Descriptions (Terms)

- Fully specified name
- Preferred term
- Acceptable synonyms

- Preferred term is usually the description seen in the system
Navigation within a hierarchy is done via the |is a| relationship

- Infective pneumonia |is a| child of infection
- Infective pneumonia |is a| child of respiratory disease
- Viral pneumonia |is a| descendant of infection
Structure of SNOMED CT

- 19 hierarchies to organise the content of SNOMED CT
- FSN indicates hierarchy in semantic tag

Semantic tags change within some hierarchies:

<table>
<thead>
<tr>
<th>Top level hierarchy</th>
<th>Sub hierarchy tag</th>
<th>Sub hierarchy 2 tag</th>
</tr>
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<tbody>
<tr>
<td>body structure</td>
<td>(body structure)</td>
<td>(cell)</td>
</tr>
<tr>
<td>body structure</td>
<td>(morphologic abnormality)</td>
<td></td>
</tr>
<tr>
<td>clinical finding</td>
<td>(disorder)</td>
<td></td>
</tr>
<tr>
<td>clinical finding</td>
<td>(finding)</td>
<td></td>
</tr>
</tbody>
</table>
More info on hierarchies

- Hierarchies most likely to used for analysis:
  - Clinical finding
  - Procedure
  - Observable
  - Stages and scales
  - Situation with explicit context
More info on hierarchies

• The **clinical finding** concepts - represent result of a clinical observation, assessment or judgment and include concept used to represent diagnosis

• The **procedure** concepts - represent activities performed in the provision of health care. Includes invasive procedures, administration of medicines, imaging, education, therapies and administrative procedures

• The **observable** concepts - Represents a question or assessment which can produce an answer or result (weight, blood pressure)

• The **staging and scales** concepts – Represent Assessment scales and tumour staging systems

• The **situation** concepts - represents concepts in which the clinical context is specified as part of the definition of the concept itself. For example, when the conditions are absent or in the past or relate to someone other than the subject of the record
Clinical Findings and procedures have a default meaning:
For a clinical finding this means that:
• the finding has actually occurred (vs. being absent or not found)
• it is occurring to the subject of record (the patient)
• it is occurring currently or at a stated past time.
For a Procedure this means that:
• the procedure was completed
• it was performed on the subject of record (the patient)
• it was done in the present time or at a stated past time.
So *procedure declined* is not in the procedure hierarchy but in situation with explicit context (tag is situation)
Browsing SNOMED CT

• … outside the EPR

• https://termbrowser.nhs.uk
‘Playtime’

• Lets look for some terms in SNOMED CT using the browser….
SNOMED browsers

- The NHS Digital SNOMED CT Browser
  https://termbrowser.nhs.uk

Search on text or IDs

Could expand these to see descendants

Shows which reference sets a concept is a member of

Parent concepts

FSN and synonyms

Child concepts
Data Quality
Tools to be used

- We will reference [Data Quality Guidance](#)
- Use [Look-up](#) for Read to SNOMED
- [SNOMED CT Browser](#)
Look-up for Read to SNOMED

Browsers
Some term text differences from Read

SNOMED CT uses the Body Structure hierarchy to specify body parts
Terms beginning [SO]
  – 7N890 00 [SO] Cervical lymph node maps to 81105003 | Cervical lymph node structure (body structure) |

SNOMED CT uses the Morphologic abnormality sub hierarchy to specify morphology
Terms beginning [M]
  – BBEJ. 00 [M] Intradermal naevus maps to 112681002 | Intradermal naevus (morphologic abnormality) |
Terms ending in NOS / NEC

Read terms ending in **NOS** (not otherwise specified)

- **v2 ReadCode:** F52z.
- **v2 TermCode:** 00
- **v2 Term30:** Otitis media NOS
- **SNOMED CT ConceptID:** 65363002
- **SNOMED CT DescriptionID:** 108597015
- **SNOMED CT Term:** Otitis media
- **SNOMED CT ConceptStatus:** Active

- **Parent:** Disorder of middle ear (disorder)
- **Parent:** Inflammation of specific body organs (disorder)
- **Parent:** Otitis (disorder)

- **Finding site:** Ear structure
  - Pathological process → Infectious process

- **Children:**
  - Acute otitis media (disorder)
  - Allergic otitis media (disorder)
  - Allergic otitis media (disorder)
  - Bilateral suppurative otitis media (disorder)
  - Catarhal otitis media (disorder)
  - Chronic otitis media (disorder)
  - Cholesterin granuloma of middle ear (disorder)
  - Cholesterin granuloma of middle ear (disorder)
  - Eustachian tube salpingitis (disorder)
  - Exudative otitis media (disorder)
  - Infective otitis media (disorder)
  - Infective otitis media (disorder)
  - Malignant otitis media (disorder)
  - Myringitis (disorder)
  - Non supplicative otitis media (disorder)

- **Parent:** Disorder of ear (disorder)
- **Parent:** Infective disorder of head (disorder)

- **Children:**
  - Bacterial ear infection (disorder)
  - Fungal ear infection (disorder)
  - Infection involving inner ear (disorder)
  - Infection of ear lobe (disorder)
  - Infection of external auditory canal (disorder)
  - Infection of external ear (disorder)
  - Infective otitis media (disorder)
# Terms ending in NOS / NEC

Read terms ending in **NEC** (not elsewhere classified)

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## Duplicate Terms

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![Concepts diagram showing Measles vaccination related terms and their SNOMED CT codes and descriptions.](concept_diagram)
## Duplicate Terms

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<tr>
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<th>v2 TermCode</th>
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</table>

### 7459 | Other respiratory support
- 74590 | Secretion clearance
- 74591 | Induced sputum
- 74592 | Nebuliser therapy
- 74593 | Control of respiration
- 74594 | Clearance of secretions of respiratory tract
- 74595 | Expectoration of induced sputum from respiratory tract
- 74597 | Other specified other respiratory support
- 74592 | Other respiratory support NOS

### 876 | Respiratory medication
- 8761 | Mist therapy
- 8762 | Inhalation therapy
- 8763 | Laryngeal intubation inhalat
- 8764 | Nebuliser therapy
- 87640 | Nebuliser therapy using mask
- 87641 | Nebuliser therapy using mouthpiece
- 8765 | Trial using nebuliser
- 8766 | Prescription of respiratory disease rescue medication
- 8762 | Respiratory medication NOS
### Outdated Terms

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<td>46635009</td>
<td>494564012</td>
<td>Type 1 diabetes mellitus</td>
<td>Active</td>
</tr>
</tbody>
</table>

#### Diabetes mellitus type 1 (disorder)

SCTID: 46635009

- Diabetes mellitus type 1
- Type 1 diabetes mellitus
- Diabetes mellitus type 1
- Type 1 diabetes mellitus
- Diabetes mellitus type 1 (disorder)

<table>
<thead>
<tr>
<th>Term</th>
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<tr>
<td>IDDM</td>
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<tr>
<td>IDDM - Insulin-dependent diabetes mellitus</td>
<td>Not acceptable</td>
</tr>
<tr>
<td>Insulin dependent diabetes mellitus</td>
<td>Not acceptable</td>
</tr>
<tr>
<td>Insulin-dependent diabetes mellitus</td>
<td>Not acceptable</td>
</tr>
<tr>
<td>Juvenile onset diabetes mellitus</td>
<td>Not acceptable</td>
</tr>
</tbody>
</table>
Terms that *should* be children but are not

C10E1 Type 1 diabetes mellitus with ophthalmic complications

Ideally have the following as children

C10EF Type 1 diabetes mellitus with diabetic cataract
C10E7 Type 1 diabetes mellitus with retinopathy
C10EP Type 1 diabetes mellitus with exudative maculopathy

Ran out of space in Read – 5 character codes
Grouper Terms

199.. | Vomiting
- 1991. | No vomiting
- 1992. | Vomiting
- 1993. | Projectile vomiting
- 1994. | Vomiting blood - fresh
- 1995. | Vomiting blood - coffee ground
- 1996. | Vomiting - bile stained
- 1997. | Petching
- 1998. | Possetting
- 1999. | Frequency of vomiting
- 199A. | Time since last episode of vomiting
- 199Z. | Vomiting NOS
O/E weight was a heading for the different findings of the patient's weight in Read, but over the years has been used with a value.
Not ambiguous

- In Read, some terms were ‘overloaded’ i.e. there were used in multiple ways
- Example:

<table>
<thead>
<tr>
<th>Assessment Name</th>
<th>Score</th>
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<th>Observable</th>
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<td>Generalized anxiety disorder 7 item</td>
<td>Generalized anxiety disorder 7 item scale (assessment scale)</td>
<td>Assessment using generalized anxiety disorder 7 item score (procedure)</td>
<td>Generalized anxiety disorder 7 item score (observable entity)</td>
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<td>Generalised anxiety disorder 2</td>
<td>Generalised anxiety disorder 2 scale (assessment scale)</td>
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<td>Alcohol use disorders identification test</td>
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<td>Alcohol use disorders identification test score (observable entity)</td>
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<td>Alcohol use disorder identification test consumption questionnaire (assessment scale)</td>
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Inactive codes

SNOMED CT can deal with inaccuracies in a way Read couldn’t:

• Concepts can be made inactive
• Descriptions can be made inactive

• Inactive concepts/descriptions should not be visible for data entry
• Inactive concepts can be used in searches
Some Read codes are mapped to inactive SNOMED CT

Acute bronchitis/bronchiolitis inactive in SNOMED CT - It is ambiguous

Need to choose
Inactive Content

*Serum folate borderline* is inactive in SNOMED CT

It is ambiguous, do have Borderline low and Borderline high

<table>
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<tr>
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<tbody>
<tr>
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Need to choose
Some Read codes are mapped to inactive SNOMED CT Descriptions

Need to choose
Inactive Content

Terms with Clinic A / Clinic B have codes mapped to inactive SNOMED CT concepts

These will map but to inactive codes; they are not interoperable, never went through GP2GP
Different Practices will have different clinics
Use specific clinic type administrative terms in future
E.g. seen in asthma clinic, referral to asthma clinic
<table>
<thead>
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<tr>
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</tbody>
</table>

**Classification Terms**

- 68962001 | Muscle pain (finding) |
- 26889001 | Myositis (disorder) |
- v2 ReadCode: N22.. |
- v2 TermCode: 00 |
- v2 Term30: Other synovium/tendon/bursa |
- SNOMED CT ConceptID: 202899002 |
- SNOMED CT DescriptionID: 311415011 |
- SNOMED CT Term: Other disorders of the synovium, tendon and bursa |
- SNOMED CT ConceptStatus: Inactive |
- 3519007 | Disorder of synovium (disorder) |
- 68172002 | Disorder of tendon (disorder) |
- 10597006 | Disorder of bursa (disorder) |
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<td>[X]Depressive episode, unspecified</td>
<td>XE1Zb</td>
<td>[X]Depressive episode, unspecified</td>
<td>35489007</td>
<td>Depressive disorder</td>
</tr>
<tr>
<td>XE1Zb</td>
<td>[X]Depression NOS</td>
<td>XE1Zb</td>
<td>[X]Depression NOS</td>
<td>35489007</td>
<td>Depressive disorder</td>
</tr>
</tbody>
</table>
Maps to different hierarchies

Template Design

<table>
<thead>
<tr>
<th></th>
<th>Under care of team</th>
<th>District nurse</th>
<th>District nurse</th>
<th>Social context</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Under care of team</td>
<td>Practice nurse</td>
<td>Practice nurse</td>
<td>Social context</td>
</tr>
<tr>
<td>1</td>
<td>Under care of team</td>
<td>Dietitian</td>
<td>Dietitian</td>
<td>Social context</td>
</tr>
<tr>
<td>1</td>
<td>Under care of team</td>
<td>Hospice</td>
<td>Hospice</td>
<td>Environment / location</td>
</tr>
<tr>
<td>1</td>
<td>Under care of team</td>
<td>Under care of care of the elderly physician</td>
<td>Under care of care of the elderly physician</td>
<td>Clinical finding</td>
</tr>
<tr>
<td>1</td>
<td>Under care of team</td>
<td>Under care of palliative care physician</td>
<td>Under care of palliative care physician</td>
<td>Clinical finding</td>
</tr>
<tr>
<td>1</td>
<td>Under care of team</td>
<td>Under care of continence nurse</td>
<td>Under care of continence nurse</td>
<td>Clinical finding</td>
</tr>
<tr>
<td>1</td>
<td>Under care of team</td>
<td>Under care of podiatrist</td>
<td>Under care of podiatrist</td>
<td>Clinical finding</td>
</tr>
</tbody>
</table>

This will mean you have to write cherry picked searches in SNOMED CT, ideally all should be Under of care terms so can interoperate (we’ll come back to this)
Data Quality
A transition
SNOMED CT Primary Care Timeline

- **Last Release of Read v2**: April 2016
- **GP System Suppliers Design Solutions**: 2017
- **Last Release of CTV3**: April 2018
- **General Practice Dual Coding Commences**: April 2016
- **SNOMED Utilised in place of Read Codes**: April 2018
Safety net - Dual Coding and the Subset

• Suppliers have been provided with a GP Subset of SNOMED CT codes for which a Read equivalent exists WITH a map to Read
  – All historical data will have a Read AND SNOMED CT code
  – New SNOMED data within the subset will also have a Read code entered by the system
  – This Dual coding approach will provide time for searches to be updated
Why move?

- Single code scheme in all patient records
- Enable data to be exchanged without mapping or text degrades
- Reporting more logical and powerful
- International: gives
  - Economies of scales
  - Suppliers use one coding scheme so can focus development on one system
  - International research benefits from a single terminology
- Will enable coded data to flow electronically from secondary care to general practice
How it will affect Users

**Data entry** - very similar, will select SNOMED CT terms (words). Users need to be aware that some terms previously in Read are no longer available (see our data quality guidance). Local templates will result in Read and SNOMED CT being recorded for a patient.
- Guidance available from NHS Digital (Delen)

**Searches** - using the supplier solution: minimal
Users need some understanding of SNOMED hierarchies and some insight into how historical data is mapped. Will have to review and possibly update local searches over time
- Guidance available from NHS Digital (Delen).

**Data Analysis** - using an in-house data warehouse will be impacted. The SNOMED CT tables need to be loaded and analysts need to understand how their SQL searches will need to change.
- Technical Guidance available from NHS Digital (Delen).
What should CCGs be doing locally?

Ensure general practices are fully sighted of transition to SNOMED CT - signpost support available

GP IT Operating Model ‘core and mandated’ requirement - comprehensive data quality advice/guidance service is available to general practice – review in light of SNOMED CT requirements

Ensure GP IT delivery partners are fully prepared, training materials updated and support staff fully prepared

Opportunity for housekeeping / review of local reports, templates

Review any local commissioned reporting/data analysis services – ensuring that data warehouse, extraction and analysis tools can accommodate SNOMED CT

If CCGs have not yet provided NHS Digital with a Nominated Point of Contact for SNOMED CT related matters, please email snomedprimarycare@nhs.net
The Communication Challenge

CCGs

GP IT delivery partners
whether this is via CSU framework or alternative provision

LPF contracts
non-LPF contracts

NHS Digital

GP Practices
Current message: Plan ahead

• What should individuals be planning now:
  
  – **Gaining awareness**
    • Listen to webinar sessions
    • Gain some familiarity with SNOMED CT
  
  – **Review local Searches**
    • Identify critical reports, will need reviewing over time
    • ‘Spring clean’ out those not used for some time
  
  – **Review templates**
    • Identify critical templates, may need reviewing
    • National Guidance in SNOMED CT? – e.g. dementia
  
  – **Check current data quality**
    • Read Data Quality guidance, does practice of code usage need to change
  
  – **Check own suppliers also making changes**
    • Check with any suppliers of analysis or other tools the practice has their own contracts with have changes in hand
Queries/searches - definition

What do we mean by queries/searches:
- Identifying patients or content in records
  - E.g. H33%
  - E.g. All patients who had a hip operation in the last 6 months

• This could be used for:
  - Reporting – which patients need to be contacted for an asthma review
  - Sending letters – include blood pressure results taken in last 3 months
  - Risk Analysis
  - Business protocols
  - QOF
  - etc.

• We will refer to these as searches from this point forward
What this is and what it isn’t

• Provides general principles for searches in SNOMED CT
• It isn’t a walk-through of suppliers solutions, suppliers will do that when their solution is ready
• Isn’t the technical detail for those with their own database BUT should be useful to those who do

• We do have a document to support this presentation

• We have documentation and a series of recorded presentations for those with their own databases who write SQL type queries — a taste at the end
Read v2 / CTV3

- Examples are in Read v2, this is where the changes are probably greatest.

- Principles in CTV3 very similar to SNOMED CT. Main differences are inactivation and modelling.
Safety net - Dual Coding and the Subset

• Suppliers have been provided with a GP Subset of SNOMED CT codes for which a Read equivalent exists WITH a map to Read
  – All historical data will have a Read AND SNOMED CT code
  – New SNOMED data within the subset will also have a Read code entered by the system
  – This Dual coding approach will provide time for searches to be updated
Re-cap on the fundamentals of SNOMED CT
Concepts and descriptions

Synonyms are truly synonymous
Searches are done on the concept id
FSN is often the term provided in search definitions

- Fully specified name
- Preferred term
- Acceptable synonyms

- Preferred term is usually the description seen in the system
Select the details tab

<table>
<thead>
<tr>
<th>Term</th>
<th>SCTID</th>
<th>Acceptability (undefined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritable bowel syndrome</td>
<td>2912822011</td>
<td>Preferred</td>
</tr>
<tr>
<td>(disorder)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irritable coon</td>
<td>18662018</td>
<td>Preferred</td>
</tr>
<tr>
<td>Adaptive colitis</td>
<td>18663011</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Colon spasm</td>
<td>1219339014</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Functional bowel disease</td>
<td>1219340011</td>
<td>Acceptable</td>
</tr>
<tr>
<td>IBS - Irritable bowel syndrome</td>
<td>1219342015</td>
<td>Acceptable</td>
</tr>
<tr>
<td>IC - Irritable colon</td>
<td>1219346017</td>
<td>Acceptable</td>
</tr>
</tbody>
</table>
• Navigation within a hierarchy is done via the |is a| relationship

• Infective pneumonia |is a| child of infection
• Infective pneumonia |is a| child of respiratory disease
• Viral pneumonia |is a| descendant of infection

Searching on attribute relationships will not initially be available in systems
Consequences of multiple parents

These are the same concept – found in more than one place
Writing a new Search
SNOMED CT in primary care
Differences?
All patients who have had …

- How might I write a search to find those patients who have had an appendectomy…
Appendectomy and all its descendants…
That’s it …. albeit this is a simple example

Consider our next example of finding all patients who have had a hip replacement …
Search for hip replacement

- Hip replacement
- Total
- Revision
- Partial
Where in the hierarchy do we search:

Parents
- Hip joint implantation (procedure)
- Implantation of joint prosthesis (procedure)
- Operation on hip joint (procedure)

Prosthetic arthroplasty
- Prosthetic arthroplasty (procedure)
- SCTID: 397956004
  Prosthetic arthroplasty (procedure)

Partial hip replacement
- Partial hip replacement (procedure)
  - SCTID: 398010007
  - Insertion of hip prosthesis (procedure)
  - Insertion of hip prosthesis (procedure)
  - Insertion of prosthesis or prosthetic device of hip

Arthroplasty of hip joint
- Arthroplasty of hip joint (procedure)
- Arthroplasty, acetabula
- Arthroplasty, acetabula
- Cup arthroplasty of hip
- Cup arthroplasty of hip
- Primary uncemented hemi
- Prosthetic arthroplasty
- Partial replacement of hip

Conversion from previous hybrid prosthetic replacement of hip joint using cement (procedure)
- Conversion to un cemented hemi arthroplasty of hip (procedure)
- Insertion of Austin-Moore prosthesis (procedure)
- Insertion of hip prosthesis, total (procedure)
- Insertion of prosthesis or prosthetic device of femoral head (procedure)
- Partial hip replacement by prosthesis (procedure)
- Prosthetic arthroplasty of the hip (procedure)
- Replacement of acetabulum of hip (procedure)

Procedure site - Indirect → Hip joint structure
Direct device → Hip prosthesis, device
Method → Surgical insertion - action
If we searched on children of Contraception 61…
Would not only get patients on contraception but also
Not on contraception terms
Not actually person of record term
Unknown whether on contraception or not

In SNOMED CT it is a true is-a relationship, so searches should be more logical.
Historical data needs to be considered

• **Note.** Part of this presentation is about dealing with anomalies with Read and how reports may return slightly different results … we will come to this a bit later.
Expressing searches
SNOMED CT in primary care
Language of SNOMED CT specifications

Operators in SNOMED CT - Expression Constraint Language (ECL)

- `conceptid` just this concept
- `<conceptid` the descendants of this concept
- `<<conceptid` this concept and all its descendants
- `^refsetId` members of refset

Then any of the above preceded by
- `MINUS` exclude concepts (s)
- `OR` include concepts(s) or concept(s)
- `AND` include concept(s) AND concepts(s)
Language of SNOMED CT concepts

Concept can be referred to in computer and human language, the syntax used is to express the concept in terms of its id and either preferred term or fully specified name.

<table>
<thead>
<tr>
<th>ID</th>
<th>term</th>
</tr>
</thead>
<tbody>
<tr>
<td>233838001</td>
<td>Acute posterior myocardial infarction (disorder)</td>
</tr>
</tbody>
</table>

OR

Can just use the concept ID – QOF will use this approach
Examples

All patients who have had an appendectomy
<<80146002 |Appendectomy|

All patients who have Type 1 or Type 2 diabetes
<<46635009 |Diabetes mellitus type 1 (disorder)| OR
<<44054006 |Diabetes mellitus type 2 (disorder)|
Example – Diabetes mellitus

Identify in SNOMED CT everyone with Diabetes mellitus but not during pregnancy

So… select the concept and all descendants

<< 73211009 | Diabetes mellitus (disorder) |
Example – Diabetes mellitus continued

We do not want to include diabetes mellitus that occurs during pregnancy.

Exclude this concept and all descendants

<< 73211009 | Diabetes mellitus (disorder) |
MINUS<<199223000 | Diabetes mellitus during pregnancy, childbirth and the puerperium (disorder) |

This search expression would exclude any concepts listed under concept 199223000.
Refsets example

\^12464001000001103 |Quality and Outcomes Framework – statins prescribable within general practice simple reference set|
Expressing a search

We can express a search in two ways:

**Use ECL and the hierarchy structure:**
*Concept and all of its descendants*

```
<<233838001 | Acute posterior myocardial infarction (disorder) |
```

**Cherry pick the codes (cluster list):**
*List each concept seperately*

```
233838001 | Acute posterior myocardial infarction (disorder) | OR
70998009 | Acute myocardial infarction of posterobasal wall (disorder) | OR
15713201000119105 | Acute ST segment elevation myocardial infarction of posterobasal wall (disorder) |
```

Although these produce the same result, the cherry pick list may only be true for a particular release. Using the hierarchy is a better way to write searches where we can.
Searches originally written in Read
Understanding search results once converted to SNOMED CT
Moving to SNOMED CT

Searches will continue to work once moved to SNOMED CT UNTIL someone starts recording data that does not have a Read code equiv.

Two aspects to consider when migrating a search from Read v2/CTV3 to SNOMED CT

1. Take the previous search definition and write a new SNOMED CT search from scratch
   • This may include SNOMED CT concepts that do not have a Read v2/CTV3 equivalent

2. Take the previous search codes and map these to SNOMED CT
   • This will need extending and reviewing in future as SNOMED CT concepts without a Read v2/CTV3 equivalent are used
Why can’t this be fully automatic?

A previous search cannot be converted automatically, as it may contain content not in Read, this needs a human check.

Example: C10..% Diabetes mellitus  TO
        << 73211009 | Diabetes mellitus (disorder) |
May be ok

Example: H33..% Asthma  TO
        << 195967001 | Asthma (disorder) |
For example includes Exercise induced Asthma, you may decide not to include this.
Lets look at existing searches

• Expand current query to all Read codes
• Expand list to all terms for all codes
• Map each to SNOMED CT
• Reduce to the list of unique SNOMED CT concepts

• Are there any other Read codes that map to these concepts?
• How do we then extend this to be a SNOMED CT search?
Forward mapping tables to convert to SNOMED CT

- For each Read v2 / CTV3 code, a FORWARD map to SNOMED CT is provided where appropriate.

- There are two mapping tables one for Read v2 and one for CTV3 (found on TRUD).

- Most maps have been clinically reviewed and are designed to work in one direction only.

- Your system supplier is using these maps to map historical Read v2/CTV3 codes to SNOMED CT.

- Your system supplier will also be converting national system reports to SNOMED CT.
Mapping existing searches: example

Take the previous search codes and map these to SNOMED CT

Following example illustrates the approach and why some results may be different once data entry moves to SNOMED CT

C10., C109J, C109K, C10C., C10D., C10E.%, C10F.% (Excluding C10F8), C10G.%, C10H.%, C10M.%, C10N.%, PKyP., C10P.%., C10Q.

How can this be transformed into SNOMED CT?
Existing searches: code level

Expanded to 73 Read codes

Which map to 67 SNOMED CT concepts

Notice two different Read codes go to the same SNOMED CT concept.
### Existing searches: term level

<table>
<thead>
<tr>
<th>Concept Id</th>
<th>Description Id</th>
<th>Description</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1000</td>
<td>00</td>
<td>Diab.mell.no comp. - juvenile</td>
<td>Type 1 diabetes mellitus</td>
<td>Active</td>
</tr>
<tr>
<td>C1000</td>
<td>11</td>
<td>Insulin dependent diab mellit.</td>
<td>Insulin-dependent diabetes mellitus</td>
<td>Active</td>
</tr>
<tr>
<td>C1001</td>
<td>00</td>
<td>Diab.mell.no comp. - adult</td>
<td>Diabetes mellitus without complication</td>
<td>Active</td>
</tr>
<tr>
<td>C1001</td>
<td>11</td>
<td>Maturity onset diabetes</td>
<td>Type II diabetes mellitus</td>
<td>Active</td>
</tr>
</tbody>
</table>
Considering historical data

• In simple terms we have performed the following:

Original search

• BUT are there any other Read codes that map to our list of SNOMED CT concepts?
Back to the example of Diabetes mellitus

When checking the forward mapping tables for the 67 concepts in the converted search we find there are other Read codes not in the original specification

• Original Read v2 specification: 73 codes
• Converted SNOMED CT specification: 67 concepts
• Read codes that also map to these: 138 codes
Other mapping features

- One Read v2/CTV3 code may go to different SNOMED CT concepts as synonyms were not always true synonyms in Read v2/CTV3
Any Questions
Extend to include content only in SNOMED CT

• We have now looked at new searches and converting searches – where considering historic Read data may need to reflect on both

• Suggestion: write a new search in SNOMED CT, then reflect on what historical content you may have missed

• The NHS Data Migration Workbench can help
Summary

• Historical data stored in Read will also have a SNOMED CT code
  – (using the forward maps from Read to SNOMED CT)

• Dual coding means that future data entered in SNOMED CT will have a Read v2/CTV3 code stored alongside it
  – (using the GP subset from SNOMED CT to Read)

• The maps mean that running a search in the original Read v2/CTV3 compared to the newly converted SNOMED CT may produce different results
Why might search results vary?

• Maybe the original report was missing a code that should have been included
• A duplicate Read code was not added to the original report when it should have been

• The SNOMED CT search should be a more accurate representation....
Mapping summary

• All searches are expected to be executed at concept level

• This is true for:
  ▪ SNOMED CT
  ▪ Read v2/CTV3

• However the maps created for mapping from Read v2 /CTV3 to SNOMED CT have been created at synonym level to allow for the fact that not all Read v2/CTV3 synonyms were true synonyms

• Codes not previously in the search can be brought into the results of a specification once mapped to SNOMED CT
Resources and Updates
Delen (public)

Welcome to the SNOMED CT Implementation in Primary Care area of Delen, the workspace we are using to collaborate with our partners and share information. You will be able to find detailed content relating to the implementation of SNOMED CT in primary care as well as links to useful resources that will support the transition.

We hope you find Delen useful and if you have any comments or suggestions for how we could improve it, please get in touch with us.

LATEST NEWS: New Date for SNOMED CT workshops for GP IT Providers - the workshops will provide valuable information in relation to the transition from Read codes to SNOMED CT for organisations providing IT services to General Practice. Sign up here: Leeds (31st October 2017)

Project Resource Centre (DELEN):
https://hscic.kahootz.com/connect.ti/t_c_home/view?objectId=299987&exp=e1
Delen (closed forums: CCGs and Trainers)

Welcome to the SNOMED CT in Primary Care Trainers workspace. Here you can share information and resources, catch up on the latest news and connect with other trainers in our discussion forum.

This workspace is restricted and available to members by invitation only.

We hope you find this site useful. If you have any comments or suggestions for how we could improve it, please get in touch with us.
Of interest? …

QOF – forthcoming webinar
Run in Read for 2017/18; run and provided in SNOMED CT for 2018/19.

Monthly snap update published – issued to all contacts

Microtest and EMIS Implementation Approach Documents available

Designing Queries & searches document available
Supplier Update

Main Publications - SNOMED CT Implementation in Primary Care

Below are a list of publications to support different facets of the transition from Read to SNOMED CT.

Note: Some of these are links to documents hosted on external sites and whilst we make every effort to ensure such links work, please let us know if you find a broken link.

- Plans & Roadmaps
- Fact Sheets
- Data Quality & Analytics
- CCG & GP Practice Information
- Supplier Requirements & Technical Information
- Other Publications

Plans & Roadmaps

- Principal Clinical Supplier Implementation Roadmap
- Microtest Evolution Transition to SNOMED CT - Implementation Approach v1.0
- EMIS Web Transition to SNOMED CT - Implementation Approach v1.0

Vision’s document in the Hive
TPPs going through final review
**EMIS Code picker**

- Available to download via their Support Centre
- Not the final version, but close to it
Search: heart attack
Filter: All codes

33 search results
- Heart attack
- Fear of heart attack
- Fear of having a heart attack
- Anxiety about having a heart attack
- Hearing aid enhanced audio attachment
- Hearing loss remits during vertigo attacks
- Attachment of bone anchored hearing prosthesis
- Electronic health record attachment type simple reference set
- Attachment of short head of biceps brachii to coracoid process
- Congestive heart failure, hypertension, age 75 years or older, diabetes, and previous stroke or transient ischemic attack risk score
- Haddenham PerTEX custom fit class 1 (18-21mmHg) thigh length with waist attachment lymphoedema garment PX-41 Beige (Haddenham Healthcare Ltd)
- Haddenham PerTEX custom fit class 2 (23-32mmHg) thigh length with waist attachment lymphoedema garment PX-42 Beige (Haddenham Healthcare Ltd)
- Haddenham PerTEX custom fit class 3 (34-46mmHg) thigh length with waist attachment lymphoedema garment PX-43 Beige (Haddenham Healthcare Ltd)
- Haddenham Goldpunt custom fit class 2 (23-32mmHg) thigh

Related codes
- Ischaemic heart disease
- Myocardial disease
- Myocardial necrosis
- Necrosis of anatomical site

Myocardial infarction
(preferred term for Heart attack)

- Acute myocardial infarction
- First myocardial infarction
- Microinfarct of heart
- Mixed myocardial ischaemia and infarction
- Myocardial infarction in recovery phase
- Myocardial infarction with complication
- Non-Q wave myocardial infarction
- Old myocardial infarction
- Postoperative myocardial infarction
- Silent myocardial infarction
- Subsequent myocardial infarction
- True posterior myocardial infarction

Selected code
Heart attack

To provide feedback on this demo please complete our short survey.
Heart attack
Fear of heart attack
Fear of having a heart attack
Anxiety about having a heart attack
Hearing aid enhanced audio attachment
Hearing loss remits during vertigo attacks
Attachment of bone anchored hearing prosthesis
Electronic health record attachment type simple reference set
Attachment of short head of biceps brachii to coracoid process
Congestive heart failure, hypertension, age 75 years or older, diabetes, and previous stroke or transient ischemic attack risk score
Haddenham Pertex custom fit class 1 (18-21mmHg) thigh length with waist attachment lymphoedema garment PX-41 Beige (Haddenham Healthcare Ltd)
Haddenham Pertex custom fit class 2 (23-32mmHg) thigh length with waist attachment lymphoedema garment PX-42 Beige (Haddenham Healthcare Ltd)
Haddenham Pertex custom fit class 3 (34-46mmHg) thigh length with waist attachment lymphoedema garment PX-43 Beige (Haddenham Healthcare Ltd)
Haddenham Goldpunkt custom fit class 2 (23-32mmHg) thigh length with waist attachment lymphoedema garment PX-42 Beige (Haddenham Healthcare Ltd)
Ischaemic heart disease
Myocardial disease
Myocardial necrosis
Necrosis of anatomical site
Myocardial infarction (preferred term for Heart attack)

To provide feedback on this demo please complete our short survey.
Carpal tunnel syndrome
Kamath and Stothard carpal tunnel syndrome questionnaire
Provision of written information about carpal tunnel syndrome
Kamath and Stothard carpal tunnel syndrome questionnaire score
Assessment using Kamath and Stothard carpal tunnel syndrome questionnaire

Related codes
- Median nerve entrapment
- Carpal tunnel syndrome
### Inguinal Hernia

**Search Result:**
- Inguinal hernia
- Left inguinal hernia
- Right inguinal hernia
- Direct inguinal hernia
- Simple inguinal hernia
- Indirect inguinal hernia
- Bilateral inguinal hernia
- Congenital inguinal hernia
- Adult inguinal hernia truss
- Infant inguinal hernia truss
- Inguinal hernia obstruction
- Inguinal hernia with gangrene
- Bilateral inguinal hernia repair
- Bilateral simple inguinal hernia
- Primary repair of inguinal hernia
- Unilateral simple inguinal hernia
- Bassini repair of inguinal hernia
- Halsted repair of inguinal hernia
- Ferguson repair of inguinal hernia
- Extrinsic indirect inguinal hernia

**Related Codes:**
- Disorder of inguinal region
- Hernia of abdominal wall
- Inguinal canal finding

**Selected Code:**
- Inguinal hernia
Microtest Screens (1/3)
Microtest Screens (2/3)
## Microtest Screens (3/3)

![Select SNOMED Code](image)

The image shows a software interface for selecting SNOMED codes. The code `C10` is selected, and the list includes various conditions related to diabetes mellitus. Some of the codes shown include:

- 3225: Gingival disease co-occurrent with diabetes mellitus
- 3226: Pancreatic hypoplasia, diabetes mellitus, congenital heart disease syndrome
- 3227: Atypical diabetes mellitus
- 3228: Diabetes mellitus
- 3229: Diabetes mellitus associated with genetic syndrome
- 3230: Drug-induced diabetes mellitus
- 3231: Diabetes mellitus associated with genetic syndrome
- 3232: Diabetes mellitus associated with receptor abnormality
- 3233: Diabetes mellitus associated with hormonal etiology
- 3234: Diabetes mellitus due to insulin receptor antibodies
- 3235: Secondary endocrine diabetes mellitus
- 3236: Diabetes mellitus in neonate small for gestational age
- 3237: Posttransplant diabetes mellitus
- 3238: Diabetes mellitus associated with pancreatic disease
- 3239: Diabetes mellitus associated with cystic fibrosis
- 3240: Type 2 diabetes mellitus
- 3241: Diabetes mellitus without complication
- 3242: Pre-existing diabetes mellitus
- 3243: Diabetes mellitus during pregnancy, childbirth and the puerperium

This interface is useful for selecting and categorizing medical codes for specific conditions.
Data warehouse and reporting
With SNOMED CT
Components of the session

- Overview of SNOMED CT
- Understanding the files released by NHS Digital
- Adding functionality to the release
- Querying the database
Recap on SNOMED CT
SNOMED CT in the UK

- Core content can be used by all countries, each country can have a National Extension where content specific to that country is created and released. E.g. NHS specific content within the UK.

- Updates are released bi-annually April/October in the UK.

- Can not use the UK extension without the International core content.

- International core content only valid in the UK once the UK edition has been released (International content is released January/July).
Building blocks of SNOMED CT

- SNOMED CT has three key building blocks
  - concepts
  - descriptions
  - relationships
- Concepts are clinical ideas we wish to convey
- Descriptions are different ways of expressing a clinical idea
- Relationships tell us how the concepts link together and also provide more information about a concept
Concepts and descriptions

Concepts and descriptions work together to specify:

- Fully specified name
- Preferred term
- Acceptable synonyms

IDs are unique and never reused

A Description ID will only ever link to one concept ID
Relationships add further detail

- Hierarchical relationships expressed via ‘is a’ relationships
- Each concept can have multiple parents (polyhierarchical)
- Logical definitions expressed via attribute relationships
How content is released

• Bi-annually through TRUD (Technology Reference Data Update Distribution Service) April and October

• Three types of releases:
  – Full: contains full version history for each component
  – Snapshot: contains only the most recent version of each component
  – Delta: contains changes in components since the last full release
Example of Full, Snapshot and Delta

CONCEPTID 61152003 | Moderate mental retardation (I.Q. 35-49) (disorder)|

How does the concept and description file look for the April 2017 release of:

- Full
- Snapshot
- Delta
**Example of Full, Snapshot and Delta - April 2017**

CONCEPTID 61152003 | Moderate mental retardation (I.Q. 35-49) (disorder) |

### Concept table

<table>
<thead>
<tr>
<th>ID</th>
<th>EFFECTIVETIME</th>
<th>ACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>61152003</td>
<td>2002-01-31</td>
<td>1</td>
</tr>
</tbody>
</table>

### Description table

<table>
<thead>
<tr>
<th>CONCEPTID</th>
<th>ID</th>
<th>EFFECTIVETIME</th>
<th>ACTIVE</th>
<th>TERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>61152003</td>
<td>101619019</td>
<td>2002-01-31</td>
<td>1</td>
<td>Moderate mental retardation (I.Q. 35-49)</td>
</tr>
<tr>
<td>61152003</td>
<td>101620013</td>
<td>2002-01-31</td>
<td>1</td>
<td>Imbecile (mental age 2-7 years)</td>
</tr>
<tr>
<td>61152003</td>
<td>101620013</td>
<td>2008-07-31</td>
<td>0</td>
<td>Imbecile (mental age 2-7 years)</td>
</tr>
<tr>
<td>61152003</td>
<td>800183013</td>
<td>2002-01-31</td>
<td>1</td>
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</tr>
<tr>
<td>61152003</td>
<td>800183013</td>
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<td>0</td>
<td>Moderate mental retardation (I.Q. 35-49) (disorder)</td>
</tr>
<tr>
<td>61152003</td>
<td>1232179016</td>
<td>2002-07-31</td>
<td>1</td>
<td>Moderate mental handicap</td>
</tr>
<tr>
<td>61152003</td>
<td>2981606015</td>
<td>2014-01-31</td>
<td>1</td>
<td>Moderate mental retardation (Intelligence Quotient 35-49)</td>
</tr>
<tr>
<td>61152003</td>
<td>2981928017</td>
<td>2014-01-31</td>
<td>1</td>
<td>Moderate mental retardation (Intelligence Quotient 35-49) (disorder)</td>
</tr>
<tr>
<td>61152003</td>
<td>536881000000110</td>
<td>2007-10-01</td>
<td>1</td>
<td>Moderate learning disability, intelligence quotient in range 35-49</td>
</tr>
<tr>
<td>61152003</td>
<td>552551000000116</td>
<td>2007-10-01</td>
<td>1</td>
<td>Moderate learning impairment, intelligence quotient in range 35-49</td>
</tr>
<tr>
<td>61152003</td>
<td>1666321000000118</td>
<td>2010-10-01</td>
<td>1</td>
<td>Moderate learning disability</td>
</tr>
</tbody>
</table>

**Version history of the descriptions**
**Example of Full, Snapshot and Delta - April 2017**

CONCEPTID 61152003 | Moderate mental retardation (I.Q. 35-49) (disorder) |

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<td>1</td>
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</tr>
<tr>
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<td>2981606015</td>
<td>2014-01-31</td>
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</tr>
<tr>
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<td>2981928017</td>
<td>2014-01-31</td>
<td>1</td>
<td>Moderate mental retardation (Intelligence Quotient 35-49) (disorder)</td>
</tr>
<tr>
<td>61152003</td>
<td>536881000000110</td>
<td>2007-10-01</td>
<td>1</td>
<td>Moderate learning disability, intelligence quotient in range 35-49</td>
</tr>
<tr>
<td>61152003</td>
<td>552551000000116</td>
<td>2007-10-01</td>
<td>1</td>
<td>Moderate learning impairment, intelligence quotient in range 35-49</td>
</tr>
<tr>
<td>61152003</td>
<td>1666321000000118</td>
<td>2010-10-01</td>
<td>1</td>
<td>Moderate learning disability</td>
</tr>
</tbody>
</table>

Just the most recent version of the descriptions
Example of Full, Snapshot and Delta - April 2017

CONCEPTID 61152003 | Moderate mental retardation (I.Q. 35-49) (disorder) |

Nothing has altered for this concept and its descriptions in the April 2017 release, so the delta do not contain any info for this concept and descriptions.
Setting up a database for SNOMED CT

Then creating query lists to query patient data
Setting up a database

Next sections we’ll create the following tables using the April 2017 Snapshot release:

- SCT_CONCEPT
- SCT_DESCRIPTION
- SCT_RELATIONSHIP
- SCT_REFSET_LANG
- SCT_CONCEPT_FSN
- SCT_TC
- SCT_QUERY
- SCT_HISTROY
- SCT_REFSET_SIMPLE
- SCT_REFSET_GP
- SCT_MAP_RctSct
- SCT_MAP_CTV3Sct

**Hold the terminology**

**Indicate descriptions for use in the UK**

**To aid in querying the data**

**Mapping tables**
Part 1: concept, description, relationship
Files from TRUD
### Table design and similarities

<table>
<thead>
<tr>
<th>SCT_CONCEPT</th>
<th>SCT_DESCRIPTION</th>
<th>SCT_RELATIONSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>ID</td>
<td>ID</td>
</tr>
<tr>
<td>EFFECTIVETIME</td>
<td>EFFECTIVETIME</td>
<td>EFFECTIVETIME</td>
</tr>
<tr>
<td>ACTIVE</td>
<td>ACTIVE</td>
<td>ACTIVE</td>
</tr>
<tr>
<td>MODULEID</td>
<td>MODULEID</td>
<td>MODULEID</td>
</tr>
<tr>
<td>DEFINITIONSTATUSID</td>
<td>CONCEPTID</td>
<td>SOURCEID</td>
</tr>
<tr>
<td>LANGUAGECODE</td>
<td>LANGUAGECODE</td>
<td>DESTINATIONID</td>
</tr>
<tr>
<td>TYPEID</td>
<td>TYPEID</td>
<td>RELATIONSHIPGROUP</td>
</tr>
<tr>
<td>TERM</td>
<td>TERM</td>
<td>TYPEID</td>
</tr>
<tr>
<td>CASESIGNIFICANCEID</td>
<td>CASESIGNIFICANCEID</td>
<td>CHARACTERISTICICTYPEID</td>
</tr>
<tr>
<td>MODIFIERID</td>
<td>MODIFIERID</td>
<td>MODIFIERID</td>
</tr>
</tbody>
</table>
Simplified version of SNOMED CT Snapshot table relationships
International and UK clinical files

- UK SNOMED CT Clinical Edition, RF2: Full, Snapshot & Delta
- UK SNOMED CT Clinical Edition, RF2: Delta

UK drug files

- UK SNOMED CT Drug Extension: Full, Snapshot & Delta
- UK SNOMED CT Drug Extension, RF2: Delta

Previously the Snapshot and Full files were also available for download separately but from October 2017 only the above 4 releases will be available.
Unpacking the TRUD files

We'll use the highlighted files in our implementation.
Bring the files together in a database

- Create three tables
  - SCT_CONCEPT, SCT_DESCRIPTION, SCT_RELATIONSHIP
- Import each of the files to these tables so have the following set up

<table>
<thead>
<tr>
<th>Database table</th>
<th>Imported from TRUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCT_CONCEPT</td>
<td>International core, UK clinical extension, UK drug extension</td>
</tr>
<tr>
<td>SCT_DESCRIPTION</td>
<td>International core, UK clinical extension, UK drug extension</td>
</tr>
<tr>
<td>SCT_RELATIONSHIP</td>
<td>International core, UK clinical extension, UK drug extension</td>
</tr>
</tbody>
</table>

Advisable to have the drugs data in the tables as there is some cross over with clinical
Looking at the TRUD file structures

• Where would you expect to find information about:

75367002 |Blood pressure (observable entity)|

• How is this expressed in the concepts, descriptions and relationships files

• If exploring, need notepad++ to open files
## Snapshot files

### 75367002 |Blood pressure (observable entity)|

### Concept table

<table>
<thead>
<tr>
<th>ID</th>
<th>EFFECTIVETIME</th>
<th>ACTIVE</th>
<th>MODULEID</th>
<th>DEFINITIONSTATUSID</th>
</tr>
</thead>
<tbody>
<tr>
<td>75367002</td>
<td>20020131</td>
<td>1</td>
<td>9000000000000207008</td>
<td>900000000000074008</td>
</tr>
</tbody>
</table>

### Description table

<table>
<thead>
<tr>
<th>ID</th>
<th>EFFECTIVETIME</th>
<th>ACTIVE</th>
<th>MODULEID</th>
<th>CONCEPTID</th>
<th>LANGUAGECODE</th>
<th>TYPEID</th>
<th>TERM</th>
<th>CASESIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>815968011</td>
<td>20020131</td>
<td>1</td>
<td>9000000000000207008</td>
<td>75367002</td>
<td>en</td>
<td>90000000000003001</td>
<td>Blood pressure (observable entity)</td>
<td>90000000000002001</td>
</tr>
<tr>
<td>125176019</td>
<td>20020131</td>
<td>1</td>
<td>9000000000000207008</td>
<td>75367002</td>
<td>en</td>
<td>90000000000013009</td>
<td>Blood pressure</td>
<td>90000000000002001</td>
</tr>
<tr>
<td>125177011</td>
<td>20020131</td>
<td>0</td>
<td>9000000000000207008</td>
<td>75367002</td>
<td>en</td>
<td>90000000000013009</td>
<td>Blood pressure, NOS</td>
<td>90000000000002001</td>
</tr>
<tr>
<td>1495437014</td>
<td>20030731</td>
<td>1</td>
<td>9000000000000207008</td>
<td>75367002</td>
<td>en</td>
<td>90000000000013009</td>
<td>BP - Blood pressure</td>
<td>90000000000002001</td>
</tr>
</tbody>
</table>

### Relationship table

<table>
<thead>
<tr>
<th>ID</th>
<th>EFFECTIVETIME</th>
<th>ACTIVE</th>
<th>MODULEID</th>
<th>SOURCEID</th>
<th>DESTINATIONID</th>
<th>RELATIONSHIPGROUP</th>
<th>TYPEID</th>
<th>CHARACTERISTICTYPEID</th>
<th>MODIFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>168204027</td>
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<td>90000000000002001</td>
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<tr>
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<td>2017-01-31</td>
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<td>0</td>
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<tr>
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<td>2002-07-31</td>
<td>0</td>
<td>9000000000000207008</td>
<td>75367002</td>
<td>70337006</td>
<td>0</td>
<td>116680003</td>
<td>900000000000011006</td>
<td>90000000000002001</td>
</tr>
</tbody>
</table>
**Relationship – just active & with descriptions**

**75367002 | Blood pressure (observable entity) |**

### Relationship table

<table>
<thead>
<tr>
<th>id</th>
<th>EFFECTIVETIME</th>
<th>active</th>
<th>sourceid</th>
<th>destinationid</th>
<th>TYPEID</th>
</tr>
</thead>
<tbody>
<tr>
<td>6806091022</td>
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<td>1</td>
<td>75367002</td>
<td>310611001</td>
<td>116680003</td>
</tr>
<tr>
<td>6806092026</td>
<td>2017-01-31</td>
<td>1</td>
<td>75367002</td>
<td>30766002</td>
<td>370132008</td>
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<tr>
<td>6806093020</td>
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<td>75367002</td>
<td>722243006</td>
<td>704318007</td>
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<tr>
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<td>75367002</td>
<td>113257007</td>
<td>704319004</td>
</tr>
<tr>
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<td>75367002</td>
<td>719984002</td>
<td>704321009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>id</th>
<th>EFFECTIVETIME</th>
<th>active</th>
<th>Source Term</th>
<th>Dest Term</th>
<th>Type Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>6806091022</td>
<td>2017-01-31</td>
<td>1</td>
<td>Blood pressure (observable entity)</td>
<td>Cardiovascular measure (observable entity)</td>
<td>Is a (attribute)</td>
</tr>
<tr>
<td>6806092026</td>
<td>2017-01-31</td>
<td>1</td>
<td>Blood pressure (observable entity)</td>
<td>Quantitative (qualifier value)</td>
<td>Scale type (attribute)</td>
</tr>
<tr>
<td>6806093020</td>
<td>2017-01-31</td>
<td>1</td>
<td>Blood pressure (observable entity)</td>
<td>Pressure (property) (qualifier value)</td>
<td>Property type (attribute)</td>
</tr>
<tr>
<td>6806094025</td>
<td>2017-01-31</td>
<td>1</td>
<td>Blood pressure (observable entity)</td>
<td>Structure of cardiovascular system (body structure)</td>
<td>Inheres in (attribute)</td>
</tr>
<tr>
<td>6806095029</td>
<td>2017-01-31</td>
<td>1</td>
<td>Blood pressure (observable entity)</td>
<td>Cardiac process (qualifier value)</td>
<td>Characterizes (attribute)</td>
</tr>
</tbody>
</table>
Concept and description active differences

Shows why can't rely on descriptions table to find out the status of a concept.

<table>
<thead>
<tr>
<th>conceptid</th>
<th>ID (term)</th>
<th>term</th>
<th>Concept status</th>
<th>Description status</th>
</tr>
</thead>
<tbody>
<tr>
<td>183478001</td>
<td>3082963016</td>
<td>Emergency hospital admission for asthma (procedure)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>233678006</td>
<td>621894013</td>
<td>Childhood asthma (disorder)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>195967001</td>
<td>580135014</td>
<td>Asthma (disorder)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>233680000</td>
<td>2738447016</td>
<td>Allergic asthma (disorder)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>389146007</td>
<td>1463325018</td>
<td>Extrinsic asthma (disorder)</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Descriptions remain active even when concepts are inactive. This allows inactive concepts to still be expressed in terms of FSN,P,S.
Summary

• Downloaded from TRUD
  – International and Clinical release
  – UK drug extension
• Created three tables to house the data:
  – SCT_CONCEPT
  – SCT_DESCRIPTION
  – SCT_RELATIONSHIP
• Populated with data from the TRUD downloads
Part 2: identifying UK terms
Language files from TRUD
Concepts and descriptions

Recall....

Concepts and descriptions work together to specify:

- Fully specified name
- Preferred term
- Acceptable synonyms
Descriptions for use in the UK

• The description files provide terms to describe the concepts
• Each country then can specify the Fully Specified Name (FSN), Preferred term (P) and acceptable synonyms (S)
• Each country can also release terms with alternate spelling for use in their country
• Need language reference sets to determine which terms to use in the UK
How to identify FSN, P, S

75367002 |Blood pressure (observable entity)|

Concept table

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<thead>
<tr>
<th>ID</th>
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<th>ACTIVE</th>
<th>MODULEID</th>
<th>DEFINITIONSTATUSID</th>
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</thead>
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<td>900000000000074008</td>
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</table>

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<th>EFFECTIVETIME</th>
<th>ACTIVE</th>
<th>MODULEID</th>
<th>CONCEPTID</th>
<th>LANGUAGECODE</th>
<th>TYPEID</th>
<th>TERM</th>
<th>CASESIGNIFICANCEID</th>
</tr>
</thead>
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<td>815968011</td>
<td>20020131</td>
<td>1</td>
<td>9000000000000207008</td>
<td>75367002</td>
<td>en</td>
<td>90000000000003001</td>
<td>Blood pressure (observable entity)</td>
<td>90000000000002000</td>
</tr>
<tr>
<td>125176019</td>
<td>20020131</td>
<td>1</td>
<td>9000000000000207008</td>
<td>75367002</td>
<td>en</td>
<td>900000000000013009</td>
<td>Blood pressure</td>
<td>90000000000002000</td>
</tr>
<tr>
<td>125177011</td>
<td>20020131</td>
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<td>9000000000000207008</td>
<td>75367002</td>
<td>en</td>
<td>900000000000013009</td>
<td>Blood pressure, NOS</td>
<td>90000000000002000</td>
</tr>
<tr>
<td>1495437014</td>
<td>20030731</td>
<td>1</td>
<td>9000000000000207008</td>
<td>75367002</td>
<td>en</td>
<td>900000000000013009</td>
<td>BP - Blood pressure</td>
<td>90000000000001700</td>
</tr>
</tbody>
</table>

Use TYPEID along with Language reference set to identify FSN, P, S

How to tell which is FSN, Preferred term and acceptable synonyms in UK
Language reference set

- Identifies which descriptions are for use within the UK:
  - Fully Specified Name
  - Preferred term
  - Synonyms

- Released in the TRUD packs already downloaded
Unpacking the TRUD files

Realm Language Refset tables - To identify the appropriate description types:

These two language files together provide information on FSN and Preferred terms for use in the UK.
Bring the files together in a database

• Create a table
  – SCT_REFSET_LANG

• Import each of the files to these tables so have the following set up

<table>
<thead>
<tr>
<th>Database table</th>
<th>Imported from TRUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCT_REFSET_LANG</td>
<td>UK clinical language file&lt;br&gt;UK drug language file</td>
</tr>
</tbody>
</table>
The reference sets needed to determine the acceptable UK descriptions are:

- 999001261000000100 National Health Service realm language reference set (clinical part)
- 999000691000001104 National Health Service realm language reference set (pharmacy part)
Determining FSN, Preferred term, synonyms

The typeId and acceptabilityId can be used together to determine the FSN, P, S for the UK.

**SCT_DESCRIPTION**
- typeId tells us if a description is:
  - FSN: 900000000000003001
  - Synonym: 900000000000013009

**SCT_REFSET_LANG**
- acceptabilityId tells us if (within the UK) this description is:
  - Preferred: 9000000000000548007
  - Acceptable: 9000000000000549004

**UK FSN**
- 1

**UK Preferred synonym/term**
- 1

**UK acceptable synonyms**
- 0-many
Using the description and concepts files

Step 1 - Create an extra column in the descriptions table
Step 2 – populate with F, P, S or leave blank so all UK acceptable descriptions can be identified (code provided separately)

```sql
select id, conceptid, term, descriptiontype, active
from SCT_DESCRIPTION
where conceptid=75367002
```

```sql
select id, conceptid, term, descriptiontype, active
from SCT_DESCRIPTION
where CONCEPTID=226031000000108
```
Advice for describing concepts for reporting

- Be consistent, choose to describe a concept by either Fully Specified Name or Preferred term.
- Remember that all the different descriptions are for data INPUT so clinicians can select the term they prefer.
- Consider creating a table with just what you want i.e. all concepts with FSN term and active status. **SCT_CONCEPT_FSN**

<table>
<thead>
<tr>
<th>id</th>
<th>ACTIVE</th>
<th>term</th>
</tr>
</thead>
<tbody>
<tr>
<td>211964006</td>
<td>0</td>
<td>Superficial burn of multiple sites of leg (disorder)</td>
</tr>
<tr>
<td>211987003</td>
<td>1</td>
<td>Deep full thickness burn of the toe(s) without loss of body part (disorder)</td>
</tr>
<tr>
<td>211990009</td>
<td>1</td>
<td>Deep full thickness burn of the lower leg without loss of body part (disorder)</td>
</tr>
<tr>
<td>212010008</td>
<td>1</td>
<td>Corrosion of first degree of ankle and foot (disorder)</td>
</tr>
<tr>
<td>212080001</td>
<td>1</td>
<td>Burn involving 50-59 percent of body surface, with 30-39 percent of body surface with full thickness burn (disorder)</td>
</tr>
<tr>
<td>281879008</td>
<td>1</td>
<td>Entire intervertebral foramen of second thoracic vertebra (body structure)</td>
</tr>
<tr>
<td>281886000</td>
<td>1</td>
<td>Entire intervertebral foramen of eighth thoracic vertebra (body structure)</td>
</tr>
<tr>
<td>281892006</td>
<td>1</td>
<td>Entire intervertebral foramen of first lumbar vertebra (body structure)</td>
</tr>
<tr>
<td>257798003</td>
<td>1</td>
<td>Unipolar diathermy (physical object)</td>
</tr>
<tr>
<td>257812009</td>
<td>1</td>
<td>Chronic peri-aortitis (disorder)</td>
</tr>
<tr>
<td>257819000</td>
<td>0</td>
<td>Surgical excision (qualifier value)</td>
</tr>
</tbody>
</table>

We'll call this table: **SCT_CONCEPT_FSN**
Summary

- Extracted UK clinical and drug language files to one database table
- Created an additional column in the Description table
- Populated this with F,P,S to identify descriptions for use in the UK as identified in the language file
- Created a table of all concepts with FSN for use in reporting, called this SCT_CONCEPT_FSN
- Could have created SCT_CONCEPT_PREF if more appropriate
Part 3: reference sets
Reference sets and Subsets

• A subset is ‘smaller set of SNOMED CT’ that meets a particular requirement(s). It is a type of reference set.

• It is often desirable to constrain the SNOMED CT concepts available to a subset, for example, to support rapid data entry of performed procedures in a radiology department or orthopaedic theatres.

• There are also subsets specifically for reporting such as Emergency Care Data Set.

• Over 300 nationally released subsets
  • https://dd4c.hscic.gov.uk/dd4c
  • http://diseasesdatabase.com/snomed/snomed_subsets.asp
Reference set example

Parents

Simple type reference set (foundation metadata concept)

Emergency care diagnosis simple reference set (foundation metadata concept)
SCTID: 991411000000109
991411000000109 | Emergency care diagnosis simple reference set (foundation metadata concept) | Emergency care diagnosis simple reference set

Term | Concept Id
--- | ---
Crushing injury of shoulder region (disorder) | 2581000
Elbow fracture - open (disorder) | 302232001
Nutritional disorder (disorder) | 2452009
Thrombocytopenic disorder (disorder) | 302215000
Elbow fracture - closed (disorder) | 302222008
Penetrating wound of eye (disorder) | 315290002
Puerperal sepsis (disorder) | 2858002
Illicit drug use (finding) | 307052004

https://termbrowser.nhs.uk
Reference set types

- There are different types of refsets, this section concentrates on the Simple refsets which are lists of codes for a specific purpose. Often referred to a subset
- Usually used to restrict data entry or reporting

999000061000000101 |Care planning activities simple reference set (foundation metadata concept)|
Unpacking the TRUD files

Need International, UK clinical & UK drug simple refsets

These three files list subsets for use in the UK that are managed by SNOMED International or NHS Digital
Bring the files together in a database

- Create a table
  - SCT_REFSET_SIMPLE
- Import each of the files to these tables so have the following set up

<table>
<thead>
<tr>
<th>Database table</th>
<th>Imported from TRUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCT_REFSET_SIMPLE</td>
<td>International core simple refset</td>
</tr>
<tr>
<td></td>
<td>UK clinical simple refset</td>
</tr>
<tr>
<td></td>
<td>UK drug simple refset</td>
</tr>
</tbody>
</table>

Column refsetId identifies each refset. Several hundred simple refsets will be in this created table.
Refset example in the database

9990000610000000101 |Care planning activities simple reference set (foundation metadata concept)|

Identifies the refset

Identifies the refset member. Usually a concept Id

<table>
<thead>
<tr>
<th>ID</th>
<th>EFFECTIVETIME</th>
<th>ACTIVE</th>
<th>MODULEID</th>
<th>REFSETID</th>
<th>REFERENCEDCOMPONENTID</th>
</tr>
</thead>
<tbody>
<tr>
<td>fb097c5c-df33-525b-a951-56dd3af8a318</td>
<td>2011-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>38598009</td>
</tr>
<tr>
<td>0dfd6684-9b41-5e2d-9949-3271bdf67903</td>
<td>2016-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>20475008</td>
</tr>
<tr>
<td>eda00167-a33a-539a-aed0-bfccdcc7cc23</td>
<td>2016-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>80855002</td>
</tr>
<tr>
<td>7cb6ee8-da3b-52cf-b3d7-6b8d60568627</td>
<td>2011-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>30490309</td>
</tr>
<tr>
<td>0faed1b8-e951-5d51-97cb-264682e4314f</td>
<td>2016-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>426699005</td>
</tr>
<tr>
<td>66924d0e-fc1e-5059-894df1b42d5c6835</td>
<td>2011-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>427064004</td>
</tr>
<tr>
<td>19684bc6-33f0-58e9-a7b2-02a74167215</td>
<td>2011-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>394684000</td>
</tr>
<tr>
<td>144a903f-8bda-505a-b72e-0fdda9fd760c</td>
<td>2011-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>185633005</td>
</tr>
<tr>
<td>f8eb2a9-50c6-557d-0a94-34e1d228507</td>
<td>2011-04-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>5233210000000107</td>
</tr>
<tr>
<td>3fd9b570-e54b-5608-99db-5b97b9c817e</td>
<td>2014-10-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>9278210000000100</td>
</tr>
<tr>
<td>66422d5b-55de-3532-8032-248783361ae</td>
<td>2013-10-01</td>
<td>1</td>
<td>9990000210000000109</td>
<td>9990000610000000101</td>
<td>8866610000000109</td>
</tr>
</tbody>
</table>
Refset example in the database cont..

- Link to the table we created called SCT_CONCEPT_FSN to give meaning to the refset members.

Will indicate whether a concept is a current active or inactive member of the refset, can be useful when reporting.

Joined on REFERENCEDCOMPONENTID to identify FSN.

<table>
<thead>
<tr>
<th>EFFECTIVETIME</th>
<th>ACTIVE</th>
<th>MODULEID</th>
<th>REFSETID</th>
<th>REFERENCEDCOMPONENTID</th>
<th>term</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>38598009</td>
<td>Measles-mumps-rubella vaccination (procedure)</td>
</tr>
<tr>
<td>2016-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>20475008</td>
<td>Bilateral endoscopic occlusion of fallopian tubes (procedure)</td>
</tr>
<tr>
<td>2016-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>80855002</td>
<td>Amputation of penis (procedure)</td>
</tr>
<tr>
<td>2011-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>304903009</td>
<td>Provision of day care (regime/therapy)</td>
</tr>
<tr>
<td>2016-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>426699005</td>
<td>Endoscopic submucosal resection of lesion of sigmoid colon using rigid</td>
</tr>
<tr>
<td>2011-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>42704004</td>
<td>Continuous pulse oximetry (procedure)</td>
</tr>
<tr>
<td>2011-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>394684000</td>
<td>Diabetic pre-pregnancy education (procedure)</td>
</tr>
<tr>
<td>2011-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>18563005</td>
<td>Contraceptive intrauterine device check - First call (procedure)</td>
</tr>
<tr>
<td>2011-04-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>5233210000000107</td>
<td>National Health Service Health Check invitation third letter (procedure)</td>
</tr>
<tr>
<td>2014-10-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>9278210000000100</td>
<td>Discharge from secondary care diabetes service (procedure)</td>
</tr>
<tr>
<td>2013-10-01</td>
<td>1</td>
<td>999000021000000109</td>
<td>999000061000000101</td>
<td>8866610000000109</td>
<td>Vitamin D deficiency annual review (regime/therapy)</td>
</tr>
</tbody>
</table>
Summary

• Extracted International, UK clinical and UK drug simple reference sets into one database table called SCT_REFSET_SIMPLE
• Understood how to find reference set members via the REFERENCEDCOMPONENTID field
• Linked to the SCT_CONCEPT_FSN table we created we can find the FSN for members of the reference set
Part 4: finding all descendants of a concept
Relationships and querying

The relationship file will tell us:

- Infective pneumonia |is a| child of infection
- Infective pneumonia |is a| child of respiratory disease

But it can’t easily tell us:

- Viral pneumonia |is a| descendant of infection
The transitive closure table

• The transitive closure table allows a user to find all the descendants of a concept defined by the \(\text{is a}\) relationship.

• The table contains two columns which represent ancestor and descendant pairs.

• Note every concept is also listed as its own ancestor and descendant

• Call table SCT_TC
Finding all the descendants of a concept

```
select a.SUBTYPEID, b.term
from SCT_TC a
join SCT_CONCEPT_FSN b
on a.SUBTYPEID=b.ID
where SUPERTYPEID=80146002
```
Part 5: finding additional ‘descendants’ of a concept
Finding additional ‘descendants’ of a concept

• Main issue
  – Inactive content with no |is a| relationships will not be in the Transitive Closure table which is created from recursively querying the |is a| relationships
Query table

• When a concept is made inactive, all the relationships become inactive
• No longer easy to use the |is a| relationship to see where this concept sat within SNOMED CT
• The Query table provides (where possible) a list of what the relationships should be if the concept was active in the form of a Transitive Closure table
• Using the Transitive Closure table and the Query table together to navigate the hierarchies ensures that queries that contain inactive concepts or data using inactive concepts can still be queried
Unpacking the TRUD files

UKTC SNOMED CT Query Table and History Substitution Table

No further processing needed on these files
Adding the files to the database

- Create 1 table
  - SCT_QUERY
- Import each of the files to these tables so have the following set up

<table>
<thead>
<tr>
<th>Database table</th>
<th>Imported from TRUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCT_QUERY</td>
<td>UK query table</td>
</tr>
</tbody>
</table>

File is ready to use, nothing else needs to be done.
Looking at the TRUD file structures

- Are there any inactive descendants of 80146002 |Appendectomy (procedure)|

```
select *
from SCT_QUERY
where supertypeid=80146002
```

Indicates the how sure we are that the subtypeid is a descendant of the supertypeid. Currently 0,1,2,3 the lower the number the more sure. Documentation supplied with the query table provides more detail.
Using the query table

```sql
select a.SUBTYPEID, b.term, b.ACTIVE
from SCT_QUERY a
join SCT_CONCEPT_FSN b
on a.SUBTYPEID = b.ID
where SUPERTYPEID=80146002
```

Results of the query table are not listed as children in the browser as they are not active concepts.
When to use the query table

Query table

• Use in conjunction with the Transitive Closure table to make sure queries that look for descendants of a concept include inactive concepts
Part 6: extracting data from a warehouse

Queries
Finding all the descendants of a concept

Use both the Transitive Closure and Query tables

select a.SUBTYPEID, b.term, b.ACTIVE from SCT_TC a
join SCT_CONCEPT_FSN b on a.SUBTYPEID=b.ID
where SUPERTYPEID=80146002
UNION
select a.SUBTYPEID, b.term, b.ACTIVE from SCT_QUERY a
join SCT_CONCEPT_FSN b on a.SUBTYPEID=b.ID
where SUPERTYPEID=80146002
Language of SNOMED CT specifications

Operators in SNOMED CT - Expression Constraint Language (ECL)

- `conceptid` just this concept
- `<conceptid` the descendants of this concept
- `<<conceptid` this concept and all its descendants
- `^refsetId` members of refset

Then any of the above preceded by

- `MINUS` exclude concepts (s)
- `OR` include concepts(s) OR concept(s)
- `AND` include concept(s) AND concepts(s)
Language of SNOMED CT concepts

Concept can be referred to in computer and human language, the syntax used is to express the concept in terms of its id and either preferred term or fully specified name.

<table>
<thead>
<tr>
<th>ID</th>
<th>term</th>
</tr>
</thead>
<tbody>
<tr>
<td>233838001</td>
<td>Acute posterior myocardial infarction (disorder)</td>
</tr>
</tbody>
</table>

QOF specifications for 2018 will use FSN. FSN is unique to helps to be clear exactly what is needed.
Interpreting ECL to SQL

\[
\text{select a.SUBTYPEID from SCT_TC a where a.SUPERTYPEID = 73211009 and a.subtypeid not in (select b.SUBTYPEID from SCT_TC b where b.SUPERTYPEID = 199223000)}
\]

union

\[
\text{select c.SUBTYPEID from SCT_QUERY c where c.SUPERTYPEID = 73211009 and c.subtypeid not in (select d.SUBTYPEID from SCT_QUERY d where d.SUPERTYPEID = 199223000)}
\]

- Returns 162 active and inactive concepts
- Use this list to query against patient data
< 365980008|tobacco use and exposure – finding|
Want to find all descendants but not 365980008 itself

```
select a.SUBTYPEID 
from SCT_TC a 
where a.SUPERTYPEID=365980008 
And subtypeid<> 365980008 
union 
Select c.SUBTYPEID 
from SCT_QUERY c 
where c.SUPERTYPEID=365980008 
And subtypeid<> 365980008
```

Finds 119 concepts
Part 7: mapping tables for Primary Care

Files from TRUD
Forward mapping tables to convert to SNOMED CT

- For each Read v2 / CTV3 code, a FORWARD map to SNOMED CT is provided where appropriate.

- There are two mapping tables one for Read v2 and one for CTV3.

- Maps have been clinically assured, and are designed to work in one direction only.

- System suppliers are using the maps to map historical Read v2/CTV3 codes to SNOMED CT.

- CSUs may need to install these for historical trend analysis.
‘Back’ mapping tables for ‘dual coding’

- SNOMED CT concepts that have a Read v2/CTV3 equivalent will be ‘dual coded’ once system suppliers switch to SNOMED CT
  - Scope is those SNOMED CT descriptions that have a Read code equivalent
  - Where possible data will have a Read code AND a SNOMED CT code
Unpacking the TRUD files

NHS Data Migration


For Dual coding

For mapping historical data
Bring the files together in a database

- Create three tables
  - SCT_REFSET_GP
  - SCT_MAP_RctSct
  - SCT_MAP_CTV3Sct
- Import each of the files to these tables so have the following set up

<table>
<thead>
<tr>
<th>Database table</th>
<th>Imported from TRUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCT_REFSET_GP</td>
<td>GP subset</td>
</tr>
<tr>
<td>SCT_MAP_RctSct</td>
<td>Forward map from Read v2 to SNOMED CT</td>
</tr>
<tr>
<td>SCT_MAP_CTV3Sct</td>
<td>Forward map from Read CTV3 to SNOMED CT</td>
</tr>
</tbody>
</table>
Looking at the TRUD file structures

Understanding the differences between the mapping files

Search for

204451006 |Anomalies of great veins (disorder)|

in both files
Results:

Search for 204451006 |Anomalies of great veins (disorder)| in both files

Read v2 to SNOMED CT map
select *
from SCT_MAP_RctSct
where conceptid=204451006

Full history of maps is shown. Effectivedate and mapstatus show most recent version

Only one concept description ID is used in the mapping in this example

Several Read v2 codes can map to the same SNOMED CT concept
The files

Search for 204451006 |Anomalies of great veins (disorder)| in both files

**GP subset**

```sql
select *
from SCT_REFSET_GP
where conceptid=204451006
```

**Read v2 subset**

999002721000000108

**Read CTV3 subset**

999002731000000105

One SNOMED CT concept and description maps to one Read v2/CTV3 code
Use case for the maps

Patient record entries pre April 2018
- Read code 1
- Read code 2

Forward mapping tables used to allocate a SNOMED CT concept to all historical data

Mapping tables
- Read code 1 = SNOMED CT concept A
- Read code 2 = SNOMED CT concept B

Patient record entries post April 2018
- SNOMED CT Concept A
- SNOMED CT Concept B
- SNOMED CT Concept C

GP subset
- SNOMED CT concept A = Read code 1
- SNOMED CT concept B = Read code 2

SNOMED CT Concept C is not in the GP subset. So will not have a Read equivalent and so won't be picked up in any reports run in Read.
H30.. & H3120 In QOF specification for Asthma

<table>
<thead>
<tr>
<th>Read code</th>
<th>ConceptID</th>
<th>Read code2</th>
<th>ConceptID2</th>
<th>Term code2</th>
</tr>
</thead>
<tbody>
<tr>
<td>173A</td>
<td>31387002</td>
<td>H3120</td>
<td>195949008</td>
<td>H30..</td>
</tr>
<tr>
<td>H3120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H33..</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H330</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3301</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H330z</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H331</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3310</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3311</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3312</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V2 Read Code</th>
<th>V2 Term Code</th>
<th>V2 Term30</th>
<th>SNOMED CT ConceptID</th>
<th>SNOMED CT DescriptionID</th>
<th>SNOMED CT Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>H33</td>
<td>00</td>
<td>Bronchitis unspecified</td>
<td>32306004</td>
<td>54101019</td>
<td>Bronchitis</td>
</tr>
<tr>
<td>H33</td>
<td>11</td>
<td>Chest infectin-unsp bronchitis</td>
<td>32306004</td>
<td>54101019</td>
<td>Bronchitis</td>
</tr>
<tr>
<td>H33</td>
<td>12</td>
<td>Recurrent wheezy bronchitis</td>
<td>195949008</td>
<td>301450011</td>
<td>Chronic asthmatic bronchitis</td>
</tr>
</tbody>
</table>

The mapping tables only bring through part of the Read code that maps to 195949008.
Summary

• Tables to aid the migration of Primary Care data from Read v2/CTV3 are available on TRUD
  – **Mapping tables** are unidirectional from legacy terminology to SNOMED CT allow historical data to be mapped to SNOMED CT.
  – **Mapping tables** show map history so need to be filtered to show most recent version
  – **GP subset** enables dual coding of SNOMED CT and Read v2/CTV3 where possible
Part 8: checklist and hints & tips
• IDs can be 18 digits long. If working in excel convert to text
• Notepad can’t cope, need Notepad++ to view files
• Descriptions can remain active even if the concept is inactive, always query at concept level
• Inactive concepts should still be included in queries
The second to last digit of a component tells us if the ID is a concept, description or relationship

0 = Concept  
1 = Description  
2 = Relationship

e.g. 11130705

Concepts released by the UK have a namespace in the conceptid to identify them

1000000 = clinical  
1000001 = drugs

e.g. 715771000000101 |Cervical smear slide broken in transit (finding)|  
e.g. 8175311000001100 |Generic Simeco chewable tablets sugar free (product)|
Check list of files needed

From TRUD
- UK SNOMED CT Clinical Edition, RF2: Full, Snapshot & Delta
- UK SNOMED CT Drug Extension, RF2: Full, Snapshot & Delta
- SNOMED CT Query Table and History Substitution Table
- NHS Data Migration

To create
- Column in description table to identify FSN, P, S
- Table of concepts and FSN or P for reporting purposes
- Transitive closure table
Next Steps …
Thank you …

• Helpdesk: snomedprimarycare@nhs.net

• We will email you:
  –