The Australian Digital Health Agency (the Agency)

Commenced operations on 1 July 2016.

Established as a statutory authority in the form of a corporate Commonwealth entity, the Agency reports to State and Territory Health Ministers through the COAG Health Council.

Leads and provides direction in developing digital health, bringing the Australian health system into the digital century.

Responsible for the national digital health strategy including the design, development, delivery and national operations, while the Commonwealth Department of Health is responsible for national digital health policy.

www.digitalhealth.gov.au
Clinical Terminology

• A structured vocabulary used in clinical practice, implemented in software applications
• Allows accurate recording of statements about the health and health care of an individual patient
• Allows the retrieval of those statements to express meaning at various levels of abstraction for clinicians, patients, researchers or organisations.
• Provides a consistent way of indexing, storing, retrieving and aggregating clinical data from structured, computerised clinical records
Clinical Terminology

• Enables
  • Naming and identification of those concepts relevant to healthcare
  • Creation of relationships between concepts to provide context to meaning
  • Communication of information without loss of detail or change to meaning
Australian Healthcare Community
malignant tumour of kidney

renal cancer

CA Renal

renal malignant tumour

363518003 malignant tumor of kidney (disorder)
SNOMED CT

Systematized Nomenclature of Medicine Clinical Terms®

Contains terms with a unique code that are machine recognisable

Managed by IHTSDO (International Health Terminology Standards Development Organisation)

Managed and distributed in Australia by The Australian Digital Health Agency

* IHTSDO® and SNOMED CT® are registered trademark(s) of the International Health Terminology Standards Development Organisation.
SNOMED CT Overview

- Standardised Clinical Terminology
- Essentially a large dictionary of clinical terms
- Designed for clinical data capture
- Covers content areas of:
  - diseases, procedures, clinical findings and therapeutic products
  - plus additional content that helps define the meaning of these major content areas
SNOMED CT-AU

- SNOMED CT-AU is the Australian extension of SNOMED CT
  - Contains SNOMED CT core files along with Australian developed documentation and terminology including reference sets
  - Release six monthly in May and November*
  - New content from the international release is taken and reviewed to ensure it is presented correctly for use in Australia
  - Rolling reviews on existing data are conducted looking at quality and suitability for Australian use
SNOMED CT-AU

• SNOMED CT-AU also contains locally created content
  • This content may be requested from external/internal stakeholders or required to aid implementations
  • New content can include new terms/concepts, as well as reference sets, guidance and implementation support documents.
  • Content is often created collaboratively as small projects with external stakeholders including jurisdictions, vendors and clinicians
SNOMED-CT Overview

- Over 300,000 concepts that are organised into 19 top-level hierarchies
  - Body structure
  - Clinical finding
  - Environment or geographic location
  - Event
  - Linkage concept
  - Observable entity
  - Organism
  - Pharmaceutical/biologic product
  - Physical force
  - Physical Object

- Procedure
- Qualifier value
- Record artefact
- Situation with explicit context
- Social context
- Special concept
- Specimen
- Staging and scales
- Substance

- + AMT
SNOMED CT structure:

- Concepts, Descriptions & Relationships
- Every component has a unique code
- Evolving terminology (not static)
- Comprehensive history tracking
- Extensions (reference sets)
How it all fits together

Concepts

• Are objects of thought
• Designated by a unique code
• Designed to covering all clinical care areas

22298006 myocardial infarction (disorder)

233868005 fungal myocarditis (disorder)

36048009 glucose measurement (procedure)

3092008 Staph. aureus (organism)
How it all fits together

Descriptions

- Terms or names assigned to concepts (human readable)
- FSN = Unambiguous description
- One or more other descriptions (preferred and synonyms)

22298006 myocardial infarction (disorder)
How it all fits together

Relationships

• Links concepts within SNOMED CT
• Facilitates unambiguous meaning
• Create hierarchies which aid navigation and retrieval

- ischaemic heart disease
- myocardial disease
- necrosis of anatomical site
- 22298006 myocardial infarction (disorder)
- Finding site
- Associated morphology
- Myocardium structure
- Infarct
Ontology

- SNOMED CT is polyhierarchical
- Concepts have 1..* parents
- Concepts are “modelled” on definitional knowledge
- Structure resolved by this knowledge.
Knowledge inferences

For example:
Viral Bronchitis – modeled as.
- causative agent = virus
- pathological process = infectious process
- finding site = bronchial structure

Concept automatically organised as
- Is A = respiratory tract infection
- Is A = viral disease
- Is A = disorder of respiratory system
Example – Viral Pneumonia

ICD-10-AM

Diseases of the Respiratory System

<table>
<thead>
<tr>
<th>Influenza and Pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>J12.9 – Viral Pneumonia, NEC</td>
</tr>
<tr>
<td>J12.9 – Viral Pneumonia, unspecified</td>
</tr>
</tbody>
</table>
Viral Pneumonia will return in searches relating to

<table>
<thead>
<tr>
<th>SNOMED CT-AU</th>
<th>ICD-10-AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>› Disorder of respiratory system</td>
<td>› Diseases of respiratory system</td>
</tr>
<tr>
<td>› Pneumonia</td>
<td>› Influenza’s and Pneumonia</td>
</tr>
<tr>
<td>› Viral pneumonia</td>
<td>› Viral Pneumonia</td>
</tr>
<tr>
<td>› Infectious diseases</td>
<td></td>
</tr>
<tr>
<td>› Inflammatory disorders</td>
<td></td>
</tr>
<tr>
<td>› Infection by sites (lung etc.)</td>
<td></td>
</tr>
<tr>
<td>› Viral infections</td>
<td></td>
</tr>
<tr>
<td>› Respiratory conditions that have had related procedures</td>
<td></td>
</tr>
<tr>
<td>› SNOMED CT uses its hierarchies and attributes to allow retrieval queries to be written</td>
<td>› ICD was developed to quantify and fund inpatient events which it will continue to do</td>
</tr>
</tbody>
</table>

Australian Government
Australian Digital Health Agency
Reference sets

Reference sets identify specific subsets of content and support a range of granularity and specificity.
NCTIS Reference sets

Fracture finding reference set
A broad context reference set that supports the recording of fracture findings.
• Closed fracture of femur
• Open fracture of maxilla

Problem/Diagnosis reference set
Provides terminology to support the recording of a patient problem or diagnosis for medical records.
• Obstructive sleep apnoea syndrome
• Calculus of gallbladder with acute cholecystitis
NCTIS Reference sets

Clinical manifestation reference set
A specific reference set that supports the recording of common clinical manifestations of adverse reaction

- Rash
- Nausea

Australian Dialect reference set (ADRS)
Specifies the Australian preferred terms and acceptable synonyms required to support the recording of clinical information in Australian eHealth implementations

- This reference set should be used with all Australian implementations
Using reference sets

Simple refsets and Language refsets can be used in combination
Using reference sets together

Custom *intersects* can be created
How does this impact clinicians?

- **Controlled vocabulary**
  - Some restriction on what is entered
  - Standardisation of language used
    - Reduce ambiguity
  - Similar to how most systems behave already
  - Synonyms in SNOMED CT support search effectiveness

- **Standardised reference**
  - Greater potential for decision support
  - Standardisation opens opportunity for new knowledge resources
How does this impact clinicians?

• Clinicians:
  o Don’t need to remember any codes
  o Don’t need to learn a “new language”
  o Don’t need to do anything “extra”
  o Shouldn’t see codes

Shouldn’t even realise they’re using SNOMED CT...
Code predefined options

Request Pathology
- LFT - Liver function test
- FBC - Full blood count
- HbA1c - Hemoglobin A1c level
- Fasting blood lipids

Sex
- Male
- Female

Risk Factors
- Impaired glucose tolerance
- Hypercholesterolemia
- Overweight
- High blood pressure
- Current smoker
- Heavy drinker
Search value sets

Allergies and Adverse Reactions

<table>
<thead>
<tr>
<th>Reaction Type</th>
<th>Causative Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food intolerance</td>
<td>Agent</td>
</tr>
</tbody>
</table>

Date of Event

Clinical Manifestation

- Rash of systemic lupus erythematosus
- Rash
- Drug-induced rash
- Drug rash
- Pruritic rash
- Butterfly rash associated with systemic lupus
- O/E - erythematous rash
- On examination - erythematous rash
- Morbilliform rash
- Maculopapular rash
Vendor dependency

• Experience with using SNOMED CT can be vendor specific
• Search functionality may affect results

Poor implementation = Poor Terminology Experience
Primary use cases

Information Models and SNOMED CT - operating together CONSTRUCT (form or make) the medical record

- Upgrading and enhancing medical documentation
- Making it computable, precise, re-usable
- Connecting healthcare practitioners across sectors & systems

81 year old female presents with approx 1 month of decreased R visual acuity
CF PH 6/18
For FFA
Right CALE ? cause - likely to be ???
Inflammatory anterior vitreous cells
Anterior chamber ??
No chorioretinitis
No ??
? vascular
No history of diabetes or hypertension but some AV ?? changes
? old branch retinal vein occlusion
Secondary use cases

- Not just ‘traditional’ statistical, costing or performance uses, which might be characterised as retrospective use
- Also important to consider secondary clinical uses
- SNOMED CT can be used prospectively
  - Care plans and ongoing management
  - Drug-Dx, drug-drug monitoring
  - Screening recalls, immunisation, pap smears etc
  - Public health surveillance
  - Clinical trials
  - Efficacy studies
Secondary use cases - clinical

Kaiser Permanente experiences:
• Dramatically lowered cardiac disease mortality
• Improved use of preferred drugs
• Rotavirus Vaccine and Intussusception
• Adult oncology standardization and protocol improvement

NHMRC – National Institute of Clinical Studies
• Pain Management of Trauma in Emergency Departments
• SNOMED CT-enabled data collected in NSW Health could be used for research and evaluation of clinical care protocols
• Methods developed for extraction and analysis
• No need for maps to ICD-10-AM
Secondary use cases

Reporting (in real time) from GPs, EDs etc..

- First line detection and identification of localised outbreaks
  - E coli infections from public swimming pools
  - Rota Virus in child care centres
  - Legionnaires disease
  - Food poisoning (salmonella)
  - MRSA (community acquired)

- Notifiable diseases – public health and preventive measures
  - Whooping cough
  - Avian ‘flu
  - Swine ‘flu
Contact

- Phone: 1300 901 001
- Email: help@digitalhealth.gov.au