Terminology: about AMT and options for implementation

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Funded by all Australian Governments to support digital innovation across Australia, the Agency operates under three core pillars:

- Giving consumers more control of their health and care when they wish it

- Connecting and empowering healthcare professionals

- Building on Australia’s distinguished leadership in discovering new medicines and treatments through international leadership in digital health.

The Agency is the system operator for the My Health Record, and a number of other clinical information systems and standards, and commenced operations on 1 July 2016.
Australian Medicines Terminology (AMT)

- Provides a standards-based foundation to support eMM activities such as prescribing and dispensing to ensure the accurate exchange of medicines information between systems, including the My Health Record system.
- The Community Pharmacy Industry Partnership Offer requires a dispensing system to include AMT Concepts to identify the dispensed medicinal products when uploading eHealth Dispense Records to the My Health Record.
The AMT is a medicines terminology that consists of:

- **Concepts** - designed to cover medicines and their defining attributes.
- **Descriptions** - human readable terms or names assigned to concepts.
- **Relationships** - links concepts within AMT.
- Unique code for every component.
- Comprehensive history tracking.
- Extensions (reference sets).
The use of the <<Disjoint>> stereotype on this diagram indicates that all subtypes of the annotated concepts (and not subtypes of other diagrammed concepts) are disjoint.

Specifically:
1) No concept may be the subtype of two different Medicinal Substance concepts.
2) No concept may be the subtype of two different Trade Product concepts that are not descendants of Trade Product Unit of Use (which is not marked as disjoint).

Note each CTPP which inherits has subpack or has component pack relationships from MFP reflects the inherited relationship target from an MPP to the appropriate CTPP.
AMT Product Concepts

Identifies the Medicinal Products

Medicinal Product
paracetamol + codeine
(SCTID: 21286011000036106)

Medicinal Product Unit of Use
paracetamol 500 mg + codeine phosphate 8 mg tablet
(SCTID: 62090011000036109)

Medicinal Product Pack
paracetamol 500 mg + codeine phosphate 8 mg tablet, 24
(SCTID: 63851011000036100)

Identifies the Trade Products

Trade Product
Panadeine
(SCTID: 13481000168104)

Trade Product Unit of Use
Panadeine tablet
(SCTID: 53950011000036101)

Trade Product Pack
Panadeine tablet, 24
(SCTID: 56519011000036100)

Containered Trade Product Pack
Panadeine tablet, 24, blister pack
(SCTID: 60561011000036107)

Active ingredients
+ strength
+ form

Active ingredients + strength + form

Active ingredients + strength + form + pack quantity

Product brand name

Product brand name + strength
+ form

Product brand name + strength + form + pack quantity

Product brand name + strength + form + pack quantity + container type

* Images are examples only and derived from the World Wide Web
Australian Medicines Terminology

• The most relevant AMT concepts to include from a community pharmacy system when uploading eHealth Dispense Records to the My Health Record is the Contained Trade Product Pack (CTPP) or Trade Product Pack (TPP).

• The TPP or medicinal product pack (MPP) may be included in a prescription message from a primary care clinical system or prescription exchange service that supports the use and exchange of AMT.
AMT Descriptions

• Created according to standardised editorial rules to ensure consistency in naming across products.

• Editorial rules are developed collaboratively with input and feedback from the AMT Support Group to ensure usability and safety. This includes pharmacists, clinicians, software vendors, medicines information suppliers, TGA, PBD and health jurisdictions.
AMT Descriptions

Where disambiguation is required for two or more similarly named products, additional rules are in place to provide clarity and avoid confusion. For example:

<table>
<thead>
<tr>
<th>Rule type</th>
<th>Trade product pack name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Coveram 5 mg/10 mg uncoated tablet, 30</td>
<td></td>
</tr>
<tr>
<td>Extended</td>
<td>Coveram 5 mg/10 mg (perindopril arginine/amlodipine) uncoated tablet, 30</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>Coveram 10 mg/5 mg uncoated tablet, 30</td>
<td></td>
</tr>
<tr>
<td>Extended</td>
<td>Coveram 10 mg/5 mg (perindopril arginine/amlodipine) uncoated tablet, 30</td>
<td></td>
</tr>
</tbody>
</table>
AMT Descriptions

• The TGA public ARTG summary document and PBS data are used as primary sources of data. This is supplemented with additional information from sponsors and references to standard pharmaceutical texts, e.g. Martindale.

• PBS have adopted the AMT descriptions for MP and MPP. These are requested from the Agency by sponsors as part of their PBAC submission.

• The Agency has worked with the TGA and PBS for several years to align medicines naming wherever possible. Some differences will continue to exist due to the different use cases, e.g. regulatory, reimbursement and clinical.
Implementation Options

- Healthcare providers and vendors may implement the AMT in their clinical information systems in multiple ways, dependent upon circumstances and business need.

- There are 3 broad options for the implementation of AMT.
Implementation Options

1. Use an existing map

- Local data may be correlated to a data source as a bridge to AMT, e.g. PBS.
- Map from local codes via the intermediate to AMT for communication with other systems.

Considerations

- Coverage of AMT, e.g. PBS is a subset.
- Depth of mapping, e.g. PBS only contains MP, MPP and TPP AMT codes.
- Currency against AMT release.
Implementation Options

2. Local mapping

- Existing local dictionary is mapped to AMT.
- AMT map used to exchange information with other systems.
- Mapping effort, maintenance and risk is locally owned.
- Map can be boot-strapped from other data sources, e.g. PBS.

Considerations

- Maintenance frequency required and overhead should be considered.
Implementation Options

3. Native AMT implementation

• Directly adopt AMT by building a local dictionary on top of AMT.
• Local codes stored are AMT codes with an extension.
• No mapping effort required, recorded codes can be communicated to other systems without translation.
• Can use a terminology server to assist with implementation.
Accessing AMT content

• The AMT is released monthly (usually the last Friday of the month) as part of the SNOMED CT-AU release.

• The **National Clinical Terminology Service (NCTS)** is the prime source. Licence holders can access the data from either:
  1. SNOMED CT-AU RF2 files available via 
     a. the Atom based syndication API; or 
     b. or manual download from the website. 
  2. FHIR terminology REST services.
RF2 Full, Snapshot and Delta

Three main file options
1. Maintain Full by adding Deltas, use queries/views work with the latest state.
3. Drop and reload a Snapshot each time.

| Concepts - Full | | Concepts - Snapshot | | Concepts - Delta | |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| id              | active effectiveTime |
| 138875005       | 1                | 20070131        | 138875005       | 1                | 20100131        |
| 138875005       | 0                | 20090731        | 404684003       | 0                | 20100131        |
| 138875005       | 1                | 20100131        | 162744006       | 1                | 20070731        |
| 404684003       | 1                | 20030131        | 3415004         | 1                | 20100131        |
| 404684003       | 0                | 20090731        |                 |                  |                 |
| 404684003       | 1                | 20100131        | 162744006       | 1                | 20020131        |
| 162744006       | 1                | 20070731        | 3415004         | 1                | 20100131        |
| 3415004         | 1                | 20100131        |                 |                  |                 |
Preferred terms vs Fully Specified name

- Concepts must have at least two descriptions, one of each following type:
  - Fully specified name (FSN) – unambiguous but can be ugly.
  - Synonym – preferred, also known as the preferred term (PT).
- Optionally can also have one or more acceptable synonyms.
- To determine the preferred synonym the language reference set must be used.
FHIR API, versions and preferred terms

- ValueSet expansions provide preferred terms.
- CodeSystem lookup can be used to get the other synonyms and FSN.
- FHIR API requests can be made by:
  1. Specifying a particular version;
  2. Without specifying a version:
     • Result is for the latest terminology version, which is explicit in the response.
- FHIR requests can also be made that span versions, or compare them.
Tools and software

• Software is also provided as part of the NCTS in collaboration with CSIRO Australian e-Health Research Centre.

• Ontoserver as a Conformant Terminology Server Application (CTSA):
  • Same software used to run the National Terminology Server (NTS) in the NCTS to provide its FHIR endpoint.
  • Aimed to run locally to:
    • cache the content of the NTS with automated content syndication to update on demand.
    • add required local content to augment the national content.
Tools and software

Snapper is provided as a mapping tool:

- Connects to the NCTS’s National Terminology Server (NTS) FHIR API.
- Enables authoring of ConceptMap, ValueSet and CodeSystem FHIR resources.
- Also enables downloading and uploading maps and code sets from CSV files.
- NTS is read only, however Snapper can write to CTSAs.
Tools and software

- Browser “Shrimp”.
- Similar browsing functionality to Snapper.
- Provides detailed view of AMT content.
- Hosted by CSIRO.
Tools and software

- Ontoserver (NTS)
- Portal
- Syndication
- Content experts
- Mapping and/or packaging
- RF2
- NCTS
- FHIR
- Snapper
- Packaging
- Mapping and/or packaging
Technical resources

The NCTS document library provides business and technical documentation explaining the AMT model and how to interpret and implement the content.

- NCTS National Services Technical Specification
- NCTS Conformant Server Applications Technical Services Specification
- NCTS Content Types Technical Specification
- NCTS Guidance for People and Processes
- NCTS Guidance for use in Healthcare Software
- SNOMED CT-AU and AMT Technical Implementation Guides
- SNOMED CT-AU and AMT Technical Implementation Guide Scripts
- AMT Concept Model and Business Use Cases
- AMT Mapping Guidelines
PBS XML

Steve Ball, PharmCIS Support
PBS XML+AMT

- PBS XML includes AMT v3 concepts:
  - MP, MPP, TPP.
  - Only for infusibles: MPUU, TPUU.
PBS XML+AMT

• Drug concepts in XML
• Version 2.12; hierarchy

<pbs:drugs-list>
  <pbs:mp>
    <pbs:mpp>
      <pbs:tpp>
PBS XML+AMT

• Drug concepts in XML
• Version 3.0; graph; references

```
<drugs-list>
  <mp></mp>
  <mpp></mpp>
  <tpp></tpp>
</drugs-list>
```
PBS XML+AMT

- PBS XML includes:
  - SNOMED-CT code
  - preferred-term

- All other data is PBS specific.
• SNOMED-CT code is child of drug concept
• Version 2.12

<pbs:mp>
  <pbs:code scheme="urn:snomed-org/sct">
    21664011000036103
  </pbs:code>
</pbs:mp>
PBS XML+AMT

- SNOMED-CT code is child of drug concept
- Version 3.0

```xml
<mp>
  <code rdf:resource="http://snomed.info/sct/900062011000036108">
    21664011000036103
  </code>
</mp>
```
PBS XML+AMT

- SNOMED-CT code can be AMT or Health.
- Distinguished by namespace:
  - Health = 1000144
  - AMT = 1000036 or 1000186
PBS XML+AMT

- SNOMED-CT code can be AMT or Health
- Version 2.12
  - Extract namespace from SNOMED-CT code
PBS XML+AMT

- SNOMED-CT code can be AMT or Health
- Version 3.0
  - Use rdf:resource attribute
    - http://snomed.info/sct/900062011000036108
    - http://snomed.info/sct/911000144106
PBS XML+AMT

- Codes may change
  - Health-to-AMT
  - AMT-to-Health
- Usually the former
PBS XML+AMT

• Codes may change
• Version 2.12; alteration

<pbs:alteration>
  <pbs:any-reference xlink:href="#a325774677"/>
  <pbs:previous>
    <pbs:code scheme="urn:snomed-org/sct">
      352631000144105
    </pbs:code>
  </pbs:previous>
</pbs:alteration>
• Codes may change
• Version 3.0; previous attribute

<previous xlink:href="#a0001">
<code xml:id="a0002"
    rdf:resource="http://snomed.info/sct/911000144106">
352631000144105</code>
</previous>

<code xml:id="a0001" previous="#a0002"
    rdf:resource="http://snomed.info/sct/900062011000036108">
678731000168104</code>
PBS XML+AMT

- non-XML alternatives
  - amt_YYYYMMDD.txt
  - amt2_YYYYMMDD.csv
  - amt2_YYYYMMDD.txt
- No change information
- End-of-life = 12 months after V3 PBS XML
Common questions

Which AMT concepts does the PBS monthly data release contain?
The AMT identifier and Preferred Term description are included for the Medicinal Product (MP), the Medicinal Product Pack (MPP) and the Trade Product Pack (TPP) for PBS items; and the Medicinal Product Unit of Use (MPUU) and Trade Product Unit of Use (TPUU) for chemotherapy infusible items.

How can non-AMT identifiers be identified in the PBS data file?
Non-AMT identifiers can be identified in the PBS data by the SNOMED CT namespace identifier. This seven digit code issued by the IHTSDO ensures that concept identifiers issued by different organisations are unique.
AMT concepts created by the NCTS use the namespace identifiers 1000036 (or 1000168), as seen in the identifier: 21664011000036103.
Pharmaceutical Benefits Division (PBD) created concepts use the namespace identifier 1000144, as seen in the identifier: 57291000144108.
Common questions

How does the PBS Code align to an AMT code?
Each PBS Code in combination with the Manufacturer Code identifies a specific brand of medicinal product at the pack size level. This is mapped to the appropriate AMT Trade Product Pack (TPP) concept.

Do all AMT codes in the PBS data exactly match codes contained in the SNOMED CT-AU releases?
The PBS includes AMT concepts wherever possible however, the Department of Health may use their own identifiers where a PBS listing occurs before the release of AMT concepts, or use their own non-AMT term where the AMT concept does not meet PBS requirements. This may occur where the PBS description requires more or less detail than the associated AMT concept. For example, PBS data differentiates salts of metoprolol whereas the AMT Medicinal Product concept does not.
Common questions

Will the non-AMT codes provided in the PBS data release be updated to AMT codes?
Interim PBS non-AMT identifiers will be replaced by AMT identifiers when available. When this change occurs (for example to replace a non-AMT identifier with an AMT identifier), the PBS XML will include a change element to provide notification of that change. However, there will always be a small number of instances where a non-AMT identifier remains.

How do I identify the code system version for an AMT release?
The SNOMED CT-AU release note contains the AMT code system version for each release. This is may be used in clinical documents, maps, or terminology servers. It follows the following format: http://snomed.info/sct/32506021000036107/version/YYYYMMDD.
Need further assistance?

• For questions in relation to the Community Pharmacy Industry Partnership Offer, please contact CommunityDispensingSystems@digitalhealth.gov.au

• For questions in relation to the AMT, please contact help@digitalhealth.gov.au

• For questions in relation to XML, PBS data or PharmCIS, please contact pbs.contact@health.gov.au
Contact us

Help Centre 1300 901 001
8am-6pm Monday to Friday AEDT

Email help@digitalhealth.gov.au

Website www.digitalhealth.gov.au

Twitter https://twitter.com/AuDigitalHealth