



Development approach for reference sets

Australian Medicines Terminology

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Final

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1 Introduction

1.1 Purpose of this document

This document describes the development approach used in creating reference sets for use by the Australian Medicines Terminology (AMT) community of practice.

The reference sets have been developed by the National Clinical Terminology and Information Service (NCTIS) within the National E-Health Transition Authority Limited (NEHTA).

1.2 Intended audience

This document has been written for those in the AMT community of practice who have a solid understanding of AMT and its associated concept model, its scope and underlying description logic. Awareness and knowledge of clinical information models and data modelling principles will aid the reader's understanding of the content of this document. It is also helpful in understanding the content if the reader has some knowledge of clinical information models and data modelling principles.

1.3 Scope of this document

The scope of this document is to provide information on reference sets that are available with the latest AMT Release.

Progressive development on reference sets will be provided in this document when and if updates are made.

The definitions and statuses applied to reference sets are described in Section 2 of this document.

1.4 Related documents

The documents tabulated below provide the context for development of the reference sets described in this document, and should be read in conjunction with this document to enhance understanding of our approach to terminology development. The location of each document within the NCTIS site¹ is provided as well.

Table 1: Related documents

Name	Location
<i>NCTIS reference set library</i> [1]	Downloads > SNOMED CT-AU > Support Materials

1.5 Questions and feedback

The development of products by the NCTIS relies on the input and cooperation of the Australian healthcare community. We value your feedback and encourage questions, comments or suggestions about NCTIS products. We also encourage your questions, comments or suggestions about the content of the reference sets.

¹ <https://nehta.org.au/aht/index.php>.

To provide feedback, or for further information regarding licensing, please contact us via:

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2 Reference sets

2.1 About reference sets

Reference sets have a range of diverse applications. At their simplest, they can be described by their two distinct purposes.

Firstly, reference sets serve as a mechanism for managing extensions, data structures and release formats for the technical implementation.

Secondly, reference sets serve as a mechanism for creating subsets of content from the terminology. These reference sets can be used by the AMT community of practice to facilitate the recording, storing, retrieval and processing of information in an electronic health record at the point of care. Each of these reference sets is used to represent a set of AMT components for a specific purpose within a defined scope. Experience has indicated that while comprehensive terminologies are valuable, they can also pose a challenge for both users and implementers due to their size and breadth of scope. Constraining available concepts to relevant sets provides a means of managing this issue.

2.2 Categorising reference sets

In distinguishing between the different types of reference sets and the different contexts in which they are applied we apply the following categorisations.

2.2.1 Structural reference sets

Structural reference sets are those that serve as a mechanism for managing extensions, data structures and release formats. These are the reference sets that have the most relevance to implementers because they provide the foundation for and support the implementation of the AMT release files.

2.2.2 Clinical content reference sets

Clinical content reference sets are those that serve as subsets of content from AMT. These are the reference sets that have the most relevance to clinicians and other users of AMT.

2.2.3 Bound and non-bound reference sets

Bound reference sets are those that align with a clinical information specification and take into account data element and data group definitions, as well as other surrounding data structures, which may or may not impact on the content of that reference set. The AMT concept model is also considered in this alignment process.

Non-bound reference sets are those that are agnostic of clinical information specifications and are instead developed against a statement of purpose, scope or general definition. Like bound reference sets, their development takes into account the AMT concept model. Unlike bound reference sets, however, they do not take into account any other definitions or data items that may co-exist where these reference sets might be implemented.

The re-use of bound or non-bound reference sets outside of the context within which they were developed should be approached with caution and a full analysis undertaken to ensure applicability.

Reference sets with specific bindings described in this document are categorised according to those bound to NEHTA clinical information specifications and those bound to other clinical information specifications.

2.3 Release Format 2

SNOMED CT² Release Format 2 (RF2) categorises AMT reference sets by their pattern, for example:

- Attribute value
- Simple map
- Complex map
- Language
- Query specification
- Annotation
- Association

For more information on the RF2 reference sets and patterns please refer to the *SNOMED CT Technical Implementation Guide* [2].

2.4 Methods for developing reference sets

2.4.1 Overview

The NCTIS is defining and refining various manual and automated methods for developing reference sets. Our primary aim in making the development approach more automated and transparent is to ensure that our methods for identifying content are always understandable, reproducible and useful to the AMT community of practice. A secondary aim in a more automated process is to reduce the burden of maintenance.

This section briefly describes the methods developed to date. They are not mutually exclusive; methods can be combined to produce the desired output.

2.4.2 Source data mapping method

This method determines suitable AMT concepts on the basis of an existing value set, codeset or list of terms. The process involves mapping the source data to AMT concepts, determining the extent of content coverage, and then creating a reference set. New concepts may or may not be created, depending on the extent of coverage and other factors such as the quality of the underlying terms within the source data files.

The mapping process may be manual or semi-automated (using the appropriate IHTSDO workbench tools). However, the output is not a simple or complex mapping reference set, but an attribute value reference set. The aim is not to produce just a mapping of the source data, but to produce a reference set of AMT concepts, which cover clinical or administrative content.

2.4.3 Source data inclusion method

This method uses reference sets as mechanisms for including content in another reference set.

² This material includes SNOMED Clinical Terms® (SNOMED CT®) which is used by the permission of the International Health Terminology Standards Development Organisation (IHTSDO®). All rights reserved. SNOMED CT was originally created by The College of American Pathologists. IHTSDO®, SNOMED® and SNOMED CT® are registered trademarks of the IHTSDO.

2.4.4 Source data exclusion method

This method uses reference sets as mechanisms for excluding content from another reference set. For example, the *Non-human reference set* within SNOMED CT-AU can be used as a mechanism for identifying non-human concepts and then excluding them or filtering them from appearing in the reference set being created. Note that the *Non-human reference set* is not a veterinary reference set; some veterinary concepts are shared with humans such as the brain and the eye.

2.4.5 Attribute method

This method comprises of two identical processes, either of which can be used in isolation or jointly. The distinction between the processes is that one is automated and the other is not.

The first process examines the allowable attributes used to define the top-level hierarchies in the AMT concept model to identify the potential concepts for the reference set. The scope, statement of purpose or definition of the reference set is taken into account, and this scope may or may not be bound to a clinical information specification. If it is bound to a specification, then the related data elements within the data group are also considered, to avoid semantic overlap between the concept model and the specifications.

The second process is an automated version of the first. The modelled attribute relationships are identified and then used to create automated rules for the inclusion or exclusion of content.

2.4.6 Concept enumeration method

This method applies automated inclusion or exclusion rules which are built from the concept enumeration values appropriate to a certain field, or a combination of fields, in the AMT core files (tables) and/or structural reference sets.

An example of this method would be to use the active field in the concept file and the valuelid field in an attribute value reference set, and then applying automated rules to certain concept enumeration values that equate to an inactive concept. This process enables the automated exclusion of inactive concepts within a reference set.

2.4.7 Simple inclusion method

This method is largely a manual method, even though an IHTSDO workbench tool is used to select concepts. The relevant top-level hierarchies are identified and then sub-hierarchies of concepts or individual concepts are selected for inclusion. The scope, statement of purpose or definition of the reference set is taken into account, and this scope may or may not be bound to a clinical information specification. If it is bound to a specification, then the related data elements within the data group are also considered to avoid semantic overlap between the concept model and the specifications.

As selections are made, rules or guidelines are produced which reflect the logic of the decisions made to include or exclude a concept. Of real importance are the justifications for the level of granularity, and the justification for how the decisions relate back to scope. While the primary aim of the guidelines is to enable reproducibility, they also form the basis of a quality check.

3 Reference sets bound to information specifications

3.1 Containered trade product pack reference set

3.1.1.1 Reference set definition and usage

The *Containered trade product pack reference set* provides terminology to describe the packaged product (medication) that is supplied for direct patient use including details of the container type to be recorded in a health record.

3.1.1.2 Binding details

This reference set is applicable across the specifications listed in Table 2 below.

Table 2: Reference set bindings

Detailed Clinical Model or Specification	Details	Considerations
Medication DCM	<p>Medicine data element DE-10194 OID: 1.2.36.1.2001.1001.101.103.10194 Definition: The medicine, vaccine or other therapeutic good which was the focus of the action.</p>	
Adverse Reaction DCM	<p>Substance/Agent data element DE-15521 OID: 1.2.36.1.2001.1001.101.103.15521 Definition: Identification of a substance, agent, or a class of substance that is considered to be responsible for the adverse reaction.</p> <p>Specific substance/Agent data element DE-16349 OID: 1.2.36.1.2001.1001.101.103.16349 Definition: Specific identification of the substance/agent considered to be responsible for the adverse reaction event.</p>	

3.1.1.3 Method for defining reference set content

The *Containered trade product pack reference set* provides terminology to support the recording of a medicine in health records within Australia.

The reference set was developed using a combination of the 'simple inclusion' and 'concept enumeration' methods. The *Containered trade product pack* hierarchy was identified as the source for applicable concepts and a further requirement of only 'current' active concepts identified for inclusion.

The constraints that were applied to develop this reference set are tabulated below.

Table 3: Containered trade product pack reference set constraints

Constraint Type	Details
Inclusions	The content must contain only child concepts with 'current' or 'pending move' active status from the <i>Containered trade product pack</i> hierarchy.
Exclusions	<p>The content must not contain any concepts that are:</p> <ul style="list-style-type: none"> • Children of <i>Medicinal product</i>. • Children of <i>Medicinal product unit of use</i>. • Children of <i>Medicinal product pack</i>. • Children of <i>Trade product</i>. • Children of <i>Trade product unit of use</i>. • Children of <i>Trade product pack</i>.

3.1.1.4 Examples of permissible values

- 18830011000036103 | *Alphamox 250 mg capsule: hard, 20 capsules, blister pack*|
- 20675011000036100 | *Diaformin-1000 1 g tablet: film-coated, 90 tablets, bottle*|

3.2 Medicinal product reference set

3.2.1.1 Reference set definition and usage

The *Medicinal product reference set* provides terminology to describe in the health record the abstract representation of the active ingredient(s) or substance(s) (devoid of strength and form).

The *Medicinal product reference set* supports 'generic prescribing' in a healthcare setting.

3.2.1.2 Binding details

This reference set is applicable across the specifications listed in Table 4 below.

Table 4: Reference set bindings

Detailed Clinical Model or Specification	Details	Considerations
Medication DCM	<p>Medicine data element DE-10194 OID: 1.2.36.1.2001.1001.101.103.10194 Definition: The medicine, vaccine or other therapeutic good which was the focus of the action.</p>	
Adverse Reaction DCM	<p>Substance/Agent data element DE-15521 OID: 1.2.36.1.2001.1001.101.103.15521 Definition: Identification of a substance, agent, or a class of substance that is considered to be responsible for the adverse reaction.</p> <p>Specific substance/Agent data element DE-16349 OID: 1.2.36.1.2001.1001.101.103.16349 Definition: Specific identification of the substance/agent considered to be responsible for the adverse reaction event.</p>	

3.2.1.3 Method for defining reference set content

The *Medicinal product reference set* provides terminology to support the recording of a medicine in health records within Australia.

The reference set was developed using a combination of the 'simple inclusion', 'concept enumeration' and 'source data exclusion' methods. The *Medicinal product* hierarchy was identified as the source for applicable concepts.

The constraints that were applied to develop this reference set are tabulated below.

Table 5: Medicinal product reference set constraints

Constraint Type	Details
Inclusions	Contains only child concepts with 'current' or 'pending move' active status from the <i>Medicinal product</i> hierarchy that have a direct relationship with <i>Medicinal product unit of use</i> concepts.
Exclusions	<p>The content must not contain any concepts that are:</p> <ul style="list-style-type: none"> • Children of <i>Medicinal product unit of use</i>. • Children of <i>Medicinal product pack</i>. • Children of <i>Trade product</i>. • Children of <i>Trade product unit of use</i>. • Children of <i>Trade product pack</i>. • Children of <i>Containerized trade product pack</i>.

3.2.1.4 Examples of permissible values

- 21823011000036103 |*adrenaline*|
- 44940011000036106 |*meropenem*|

3.3 Medicinal product pack reference set

3.3.1.1 Reference set definition and usage

The *Medicinal product pack reference set* provides terminology to describe within a health record, an abstract concept representing the properties of one or more quantitatively and clinically equivalent Trade Product Packs (TPP).

3.3.1.2 Binding details

This reference set is applicable across the specifications listed in Table 6 below.

Table 6: Reference set bindings

Detailed Clinical Model or Specification	Details	Considerations
Medication DCM	<p>Medicine data element</p> <p>DE-10194</p> <p>OID: 1.2.36.1.2001.1001.101.103.10194</p> <p>Definition: The medicine, vaccine or other therapeutic good which was the focus of the action.</p>	
Adverse Reaction DCM	<p>Substance/Agent data element</p> <p>DE-15521</p> <p>OID: 1.2.36.1.2001.1001.101.103.15521</p> <p>Definition: Identification of a substance, agent, or a class of substance that is considered to be responsible for the adverse reaction.</p> <p>Specific substance/Agent data element</p> <p>DE-16349</p> <p>OID: 1.2.36.1.2001.1001.101.103.16349</p> <p>Definition: Specific identification of the substance/agent considered to be responsible for the adverse reaction event.</p>	

3.3.1.3 Method for defining reference set content

The *Medicinal product pack reference set* provides terminology to support the recording of a medicine in health records within Australia.

The reference set was developed using a combination of the 'simple inclusion', 'concept enumeration' and 'source data exclusion' methods. The *Medicinal product pack* hierarchy was identified as the source for applicable concepts.

The constraints that were applied to develop this reference set are tabulated below.

Table 7: Medicinal product pack reference set constraints

Constraint Type	Details
Inclusions	The content must contain only child concepts with 'current' or 'pending move' active status from the <i>Medicinal product pack</i> hierarchy.
Exclusions	<p>The content must not contain any concepts that are:</p> <ul style="list-style-type: none"> • Children of <i>Medicinal product</i>. • Children of <i>Medicinal product unit of use</i>. • Children of <i>Trade product</i>. • Children of <i>Trade product unit of use</i>. • Children of <i>Trade product pack</i>. • Children of <i>Containerized trade product pack</i>.

3.3.1.4 Examples of permissible values

- 46470011000036101 | *aciclovir 5% (50 mg/g) cream, 10 g*|
- 63748011000036109 | *pseudoephedrine hydrochloride 120 mg tablet, 10*|

3.4 Medicinal product unit of use reference set

3.4.1.1 Reference set definition and usage

The *Medicinal product unit of use reference set* provides terminology to describe within a health record an abstract concept representing the properties of one or more equivalent Trade Product Units of Use (TPUUs).

3.4.1.2 Binding details

This reference set is applicable across the specifications listed in Table 8 below.

Table 8: Reference set bindings

Detailed Clinical Model or Specification	Details	Considerations
Medication DCM	<p>Medicine data element DE-10194 OID: 1.2.36.1.2001.1001.101.103.10194 Definition: The medicine, vaccine or other therapeutic good which was the focus of the action.</p>	
Adverse Reaction DCM	<p>Substance/Agent data element DE-15521 OID: 1.2.36.1.2001.1001.101.103.15521 Definition: Identification of a substance, agent, or a class of substance that is considered to be responsible for the adverse reaction.</p> <p>Specific substance/Agent data element DE-16349 OID: 1.2.36.1.2001.1001.101.103.16349 Definition: Specific identification of the substance/agent considered to be responsible for the adverse reaction event.</p>	

3.4.1.3 Method for defining reference set content

The *Medicinal product unit of use reference set* provides terminology to support the recording of medicines in health records within Australia.

The reference set was developed using a combination of the 'simple inclusion', 'concept enumeration' and 'source data exclusion' methods. The *Medicinal product unit of use* hierarchy was identified as the source for applicable concepts.

The constraints that were applied to develop this reference set are tabulated below.

Table 9: Medicinal product unit of use reference set constraints

Constraint Type	Details
Inclusions	The content must contain only child concepts with 'current' or 'pending move' active status from the <i>Medicinal product unit of use</i> hierarchy that have a direct relationship with <i>Trade product unit of use</i> concepts.
Exclusions	<p>The content must not contain any concepts that are:</p> <ul style="list-style-type: none"> • Children of <i>Medicinal product</i>. • Children of <i>Medicinal product pack</i>. • Children of <i>Trade product</i>. • Children of <i>Trade product unit of use</i>. • Children of <i>Trade product pack</i>. • Children of <i>Containerised trade product pack</i>.

3.4.1.4 Examples of permissible values

- 23550011000036101 |*amoxycillin 250 mg capsule*|
- 23529011000036106 |*iloprost 20 microgram/2 mL inhalation, ampoule*|

3.5 Trade product reference set

3.5.1.1 Reference set definition and usage

The *Trade product reference set* provides terminology to describe within a health record the product (medication) brand name or the grouping of products into a 'family', for either single component products or components of multi-component products.

3.5.1.2 Binding details

This reference set is applicable across the specifications listed in Table 10 below.

Table 10: Reference set bindings

Detailed Clinical Model or Specification	Details	Considerations
Medication DCM	<p>Medicine data element DE-10194 OID: 1.2.36.1.2001.1001.101.103.10194 Definition: The medicine, vaccine or other therapeutic good which was the focus of the action.</p>	
Adverse Reaction DCM	<p>Substance/Agent data element DE-15521 OID: 1.2.36.1.2001.1001.101.103.15521 Definition: Identification of a substance, agent, or a class of substance that is considered to be responsible for the adverse reaction.</p> <p>Specific substance/Agent data element DE-16349 OID: 1.2.36.1.2001.1001.101.103.16349 Definition: Specific identification of the substance/agent considered to be responsible for the adverse reaction.</p>	

3.5.1.3 Method for defining reference set content

The *Trade product reference set* provides terminology to support the recording of a medicine in health records within Australia.

The reference set was developed using a combination of the 'simple inclusion', 'concept enumeration' and 'source data exclusion' methods. The *Trade product* hierarchy was identified as the source for applicable concepts.

The constraints that were applied to develop this reference set are tabulated below.

Table 11: Trade product reference set constraints

Constraint Type	Details
Inclusions	The content must contain only child concepts with 'current' or 'pending move' active status from the <i>Trade product</i> hierarchy.
Exclusions	<p>The content must not contain any concepts that are:</p> <ul style="list-style-type: none"> • Children of <i>Medicinal product</i>. • Children of <i>Medicinal product unit of use</i>. • Children of <i>Medicinal product pack</i>. • Children of <i>Trade product unit of use</i>. • Children of <i>Trade product pack</i>. • Children of <i>Containerised trade product pack</i>.

3.5.1.4 Examples of permissible values

- 65136011000036105 |*Brolene Eye Drops*|
- 3422011000036106 |*Pepzan*|

3.6 Trade product pack reference set

3.6.1.1 Reference set definition and usage

The *Trade product pack reference set* provides terminology to describe within a health record the packaged product (medication) that is supplied for direct patient use.

3.6.1.2 Binding details

This reference set is applicable across the specifications listed in Table 12 below.

Table 12: Reference set bindings

Detailed Clinical Model or Specification	Details	Considerations
Medication DCM	<p>Medicine data element DE-10194 OID: 1.2.36.1.2001.1001.101.103.10194 Definition: The medicine, vaccine or other therapeutic good which was the focus of the action.</p>	
Adverse Reaction DCM	<p>Substance/Agent data element DE-15521 OID: 1.2.36.1.2001.1001.101.103.15521 Definition: Identification of a substance, agent, or a class of substance that is considered to be responsible for the adverse reaction.</p> <p>Specific substance/Agent data element DE-16349 OID: 1.2.36.1.2001.1001.101.103.16349 Definition: Specific identification of the substance/agent considered to be responsible for the adverse reaction event.</p>	

3.6.1.3 Method for defining reference set content

The *Trade product pack reference set* provides terminology to support the recording of a medicine in health records within Australia.

The reference set was developed using a combination of the 'simple inclusion', 'concept enumeration' and 'source data exclusion' methods. The *Trade product pack* hierarchy was identified as the source for applicable concepts.

The constraints that were applied to develop this reference set are tabulated below.

Table 13: Trade product pack reference set constraints

Constraint Type	Details
Inclusions	The content must contain only child concepts with 'current' or 'pending move' active status from the <i>Trade product pack</i> hierarchy.
Exclusions	<p>The content must not contain any concepts that are:</p> <ul style="list-style-type: none"> • Children of <i>Medicinal product</i>. • Children of <i>Medicinal product unit of use</i>. • Children of <i>Medicinal product pack</i>. • Children of <i>Trade product</i>. • Children of <i>Trade product unit of use</i>. • Children of <i>Containerized trade product pack</i>.

3.6.1.4 Examples of permissible values

- 12167011000036107 | *Adalat 20 mg tablet: film-coated, 60 tablets*|
- 11482011000036107 | *Diazepam USP (DBL) 10 mg/2 mL injection: solution, 5 x 2 mL ampoules*|

3.7 Trade product unit of use reference set

3.7.1.1 Reference set definition and usage

The *Trade product unit of use reference set* provides terminology to describe within a health record a single dose unit of a finished dose form that contains a specified amount of an active ingredient substance and is grouped within a particular Trade Product.

3.7.1.2 Binding details

This reference set is applicable across the specifications listed in Table 14 below.

Table 14: Reference set bindings

Detailed Clinical Model or Specification	Details	Considerations
Medication DCM	<p>Medicine data element DE-10194 OID: 1.2.36.1.2001.1001.101.103.10194 Definition: The medicine, vaccine or other therapeutic good which was the focus of the action.</p>	
Adverse Reaction DCM	<p>Substance/Agent data element DE-15521 OID: 1.2.36.1.2001.1001.101.103.15521 Definition: Identification of a substance, agent, or a class of substance that is considered to be responsible for the adverse reaction.</p> <p>Specific substance/Agent data element DE-16349 OID: 1.2.36.1.2001.1001.101.103.16349 Definition: Specific identification of the substance/agent considered to be responsible for the adverse reaction event.</p>	

3.7.1.3 Method for defining reference set content

The *Trade product unit of use reference set* provides terminology to support the recording of a medicine in health records within Australia.

The reference set was developed using a combination of the 'simple inclusion', 'concept enumeration' and 'source data exclusion' methods. The *Trade product unit of use* hierarchy was identified as the source for applicable concepts and a further requirement of only 'current' active concepts identified for inclusion.

The constraints that were applied to develop this reference set are tabulated below.

Table 15: Trade product unit of use reference set constraints

Constraint Type	Details
Inclusions	The content must contain only child concepts with 'current' or 'pending move' active status from the <i>Trade product unit of use</i> hierarchy.
Exclusions	The content must not contain any concepts that are: <ul style="list-style-type: none"> • Children of <i>Medicinal product</i>. • Children of <i>Medicinal product unit of use</i>. • Children of <i>Medicinal product pack</i>. • Children of <i>Trade product</i>. • Children of <i>Trade product pack</i>. • Children of <i>Containerised trade product pack</i>.

3.7.1.4 Examples of permissible values

- 6355011000036103 |*Alprim (trimethoprim 300 mg) tablet: uncoated, 1 tablet*|
- 65669011000036108 |*Nurofen (ibuprofen 5% (50 mg/g)) gel*|

3.8 Substance to SNOMED CT-AU mapping reference set

3.8.1 Reference set definition and usage

The *Substance to SNOMED CT-AU mapping reference set* is developed for the implementers of AMT, SNOMED CT-AU and NEHTA DCMs to enable rule development within decision support systems.

AMT and SNOMED CT-AU are currently separate terminologies, and therefore the relationships between AMT products (and their ingredients) and SNOMED CT-AU substances are not stated. The *Substance to SNOMED CT-AU mapping reference set* will contain all AMT substances that are used in a modelled AMT product with a corresponding equivalent or supertype³ map to a substance in SNOMED CT-AU.

Decision support systems can utilise the relationship or the map for identification of potential allergies, drug-drug and drug-disease interactions:

- Adverse drug reaction and allergy

The NCTIS has developed a Clinical Information Component for Adverse Reactions. The element capturing the agent or substance within the clinical information component can utilise the *Substance to SNOMED CT-AU mapping reference set* to link the recorded product that caused the reaction to the substance(s) (as described in SNOMED CT-AU) that the patient might have had a reaction to. This map can then be used for the purpose of adverse drug reaction reporting (e.g. TGA ADRS) and decision support alerts.

- Drug-drug and drug-disease interaction

Decision support alerts embedded in medication dispensing software or electronic clinical reference materials are able to utilise the *Substance to SNOMED CT-AU mapping reference set* for identification of potential interactions between drugs and diseases.

³ That is, the nearest relevant parent concept.

A mapping file containing both the equivalent and supertype map will be released as part of the AMT release:

- Equivalent (bi-directional) mapping of non-orphaned AMT substances to SNOMED CT-AU substances. (See Section 3.8.2.1.1 below.)
- Supertype (uni-directional) mapping of non-orphaned AMT substances that have no equivalent SNOMED CT-AU substances, are mapped to the nearest parent concept (i.e. supertype concept) in the SNOMED CT-AU *Substance* hierarchy. This is a directional map and must only be used from AMT to SNOMED CT-AU.

3.8.2 Method for defining reference set content and permissible values

3.8.2.1 Inclusions

All AMT substances that are used in a modelled AMT product are possible candidates for inclusion, unless otherwise stated in Section 3.8.2.2.

3.8.2.1.1 Equivalent map

Every AMT substance that has an exact concept match in SNOMED CT-AU is mapped as equivalent. Note, the definition of 'exact concept match' is not only restricted to a simple description match but also includes semantic equivalence. See 'Spelling difference' and 'Same meaning different expression' types in the following table. This table lists different types of equivalent mapping categorised in three groups.

Table 16: Inclusions – equivalent map types

Map Type	Explanation and permissible values	AMT (example)	SNOMED CT-AU (example)
Exact match	Substance descriptions in AMT and SNOMED CT-AU are exact (word for word) matches. <ul style="list-style-type: none"> Example: nicotine 	2393011000036109 <i>nicotine</i>	68540007 <i>Nicotine</i>
Spelling difference	Substance descriptions in SNOMED CT-AU FSN, PT or Synonym have the exact same meanings but have accepted spelling variations compared to the AMT description, e.g. Australian spelling. <ul style="list-style-type: none"> Example: amoxicillin 	1799011000036105 <i>amoxycillin</i>	372687004 <i>Amoxicillin</i>
Same meaning different expression	A substance description in SNOMED CT-AU FSN, PT or Synonym uses a different expression to represent an equivalent AMT substance. <ul style="list-style-type: none"> Example: Vitamin K 	31759011000036100 <i>phytomenadione</i>	65183007 <i>Vitamin K</i>

3.8.2.1.2 Supertype map

Where a substance in AMT has no equivalent concept in SNOMED CT-AU, it will be mapped to the nearest supertype substance, and an equivalent concept will be modelled in a future release. (See also Section 3.8.3.) Table 17 lists different types of supertype mapping categorised in six groups.

Table 17: Inclusions – supertype map

Substance Type	Explanation and permissible values	AMT (example)	SNOMED CT-AU (example)
Vaccine Substances	<p>An AMT substance concept representing a vaccine component is more granular than a comparable SNOMED CT-AU substance concept.</p> <ul style="list-style-type: none"> Example: Pertussis vaccine 	73654011000036109 <i>Bordetella pertussis, acellular pertactin vaccine</i>	396433007 <i>Pertussis vaccine</i>
Substance hydration	<p>An AMT substance has a specific hydration but does not exist in SNOMED CT-AU.</p> <p>Note: SNOMED CT-AU substances that do not specify a hydration are considered to be 'anhydrous'.</p> <ul style="list-style-type: none"> Example: tiotropium bromide monohydrate 	32069011000036108 <i>tiotropium bromide monohydrate</i>	425812008 <i>tiotropium bromide</i>
Antivenin/ Antivenom	<p>An AMT antivenin substance concept is more specific than a comparable SNOMED CT-AU substance concept.</p> <ul style="list-style-type: none"> Example: snake antivenom 	30844011000036109 <i>black snake antivenom</i>	71289008 <i>snake antivenin</i>
Substances with salts	<p>A salt of a substance exists in AMT but not in SNOMED CT-AU.</p> <ul style="list-style-type: none"> Example: Vitamin C 	30780011000036109 <i>ascorbate calcium threonate complex</i>	126230002 <i>calcium ascorbate</i>
Nutritional/ Dietary Supplements	<p>AMT contains substances that represent a combination of substances contained in a nutritional/dietary supplement.</p> <p>In the mapping file, a map to the nearest supertype substance will be provided.</p> <ul style="list-style-type: none"> Example: multi-ingredient supplement 	78583011000036109 <i>high fat formula with vitamins, minerals and trace elements and low in protein and carbohydrate</i>	427298002 <i>Enteral dietary supplement</i>

3.8.2.2 Exclusions

Any AMT substance concept that has been identified as erroneous will be excluded. The following table lists different types of AMT substance concepts that are excluded from the *Substance to SNOMED CT-AU mapping reference set*.

Table 18: Exclusion types

Substance Type	Explanation and examples	AMT (example)	SNOMED CT-AU (example)
Orphan Substances	Substances that are identified as erroneous 'orphans' will not be mapped at this stage. Orphan substances are those which do not have a direct relationship modelled to an AMT product, namely MPUU and TPUU concepts. Example: 2-deoxy-2-(18F)fluoro-d-glucose	30654011000036101 2-deoxy-2-(18F)fluoro-d-glucose	N/A
Duplicate substances	The AMT <i>Substance</i> hierarchy contains duplicate substances with separate IDs representing the same concept. In such cases all instances of the substance in AMT will be mapped to the single SNOMED CT-AU concept. Example: cranberry	87047011000036100 vaccinium macrocarpon and 75903011000036106 cranberry	227421003 Cranberries
Dressings	No map will be provided for AMT substances representing dressing products. Where the dressing in AMT contains a substance, e.g. Povidone or silver, an issue will be logged to remodel the AMT product to include a relationship to the contained substance. Example: silver nitrate wound dressing	48159011000036101 dressing with silver	N/A

3.8.3 Future developments

Where no equivalent concept exists in SNOMED CT-AU, content submissions will be made requesting new *Substance* concepts in SNOMED CT to allow equivalence mapping. Where inclusion in the International release is rejected, development of a suitable concept for SNOMED CT-AU will be considered.

4 References

1. NEHTA. *NCTIS Reference set library*. Sydney: NCTIS; 2013. Release 20130531. Available from: https://nehta.org.au/aht/index.php?option=com_docman&task=cat_view&gid=21&Itemid=40.
2. IHTSDO. *SNOMED CT Technical Implementation Guide*. Copenhagen: IHTSDO; 2013. July 2013 release. Available from: <http://www.snomed.org/doc>.