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1 Introduction

1.1 Purpose

This document provides the details of the Australian Medicines Terminology (AMT) concept model. It briefly explains what the AMT product is and why it exists, but primarily focuses on describing the components of the model, their relationship to one another and SNOMED CT.

The development of a standard medicines terminology, such as the Australian Medicines Terminology (AMT), plays a vital role in promoting interoperability in medicines management. This standardized terminology uniquely identifies and describes medicines, allowing for accurate communication and transfer of medication-related information between computer systems used by clinicians and consumers.

1.2 Scope

This document will introduce the technical design of the AMT concept model including the data properties and content covered.

It does not provide detailed guidance on how to implement AMT components, as other documents exist for this purpose, including the following:

- SNOMED CT-AU Guide for Terminology Use in Prescribing
- SNOMED CT-AU Australian Technical Implementation Guide

1.3 Audience

This document is intended for persons with a practical interest in implementing AMT or using AMT-coded data. The target audience is primarily technical those with a technical perspective but can include others looking to adopt AMT.

Technical Software developers, Architects and Data Analysis

Clinical Healthcare professionals and other end users

Business Business owners, product managers, project managers, policymakers

2 The AMT in Context

2.1 Overview

Currently, there are multiple code systems for medicines in use in Australia, each with similar essential data but varying formats and functions. These include:

- The Australian Register of Therapeutic Goods (ARTG) maintained by the Therapeutic Goods Administration (TGA) containing regulatory and licencing information,
- The Pharmaceutical Benefits Scheme (PBS) containing subsidy information,
- The National Product Catalogue operated by GS1 Australia containing supply chain information,
- State-wide and local hospital drug formularies,
- Proprietary drug files utilized by clinical software and knowledge resource industries.

To address this situation and enhance digital health interoperability, the AMT was developed as the standardized medicines terminology for Australia. The AMT aims to unify and streamline the description of medicines, facilitating electronic information exchange without any loss of meaning or misinterpretation. By adopting the AMT, the goal of achieving seamless interoperability in the digital health domain is further advanced.

2.2 Aims and objectives of the AMT

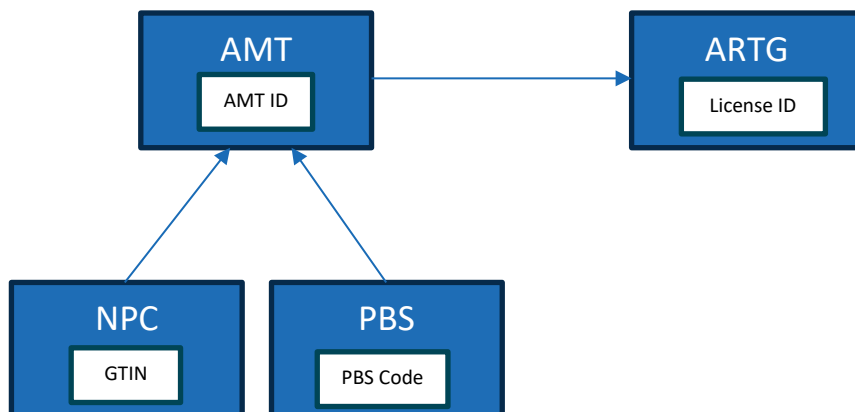
The AMT provides standardized identification for brand and generic medicines, including associated components, using accurate naming conventions. Its purpose is to unambiguously identify commonly used medicines in Australian use. Alongside other terminologies, classifications, and decision support engines, the AMT facilitates various aspects of electronic medication management in clinical information systems.

These objectives align with the *Guiding Principles for medication management continuity* (Australian Pharmaceutical Advisory Council, 2005). The AMT is utilized in national eHealth specifications to describe medicines in various clinical documents, including Prescription Records, Dispense Records, Shared Health Summaries, Discharge Summaries, Event Summaries, eReferrals, Specialist Letters, and more.

The AMT serves as a fundamental component of the My Health Record system, as outlined in the Concept of Operations: PCEHR System document. The NCTS continually collaborates with stakeholders, clinicians, terminology experts, and international partners to refine the AMT specifications and ensure their effectiveness.

2.3 Relationship to other national medicines datasets

AMT's primary purpose is to identify Australian medicines products uniquely and unambiguously, in branded and generic terms. It is designed to work with other national medicines datasets, each with their own specific purpose. The diagram below shows these datasets and their relationships.



AMT contains a map to the licence identifier from the Australian Register of Therapeutic Goods, referencing the regulatory data for the product AMT is identifying.

The Pharmaceutical Benefits Scheme monthly publication contains a mapping to AMT SNOMED CT identifiers, identifying the products which are the subject of subsidies identified by PBS item codes.

GS1 Australia provides suppliers the ability to record AMT SNOMED CT identifiers in their supply chain records in the National Product Catalogue, providing a link between Global Trade Identifier Numbers used in barcodes on products to AMT concepts.

2.4 Scope of the AMT

2.4.1 In scope

Content

The AMT includes medicines that are available in Australia for the treatment of human patients, including:

- items from the Pharmaceutical Benefits Scheme (PBS) and Repatriation Pharmaceutical Benefits Scheme (RPBS);
- a range of items from the Therapeutic Goods Administration (TGA), including TGA registered items (AUST R), and TGA listed items (AUST L) in Australia; and
- other medicines and therapeutic products that are required to support the AMT use cases, e.g. non-TGA approved or extemporaneously compounded therapeutic goods used state-wide or nationally.
- At present, the AMT does not contain all products in the categories listed above. The addition of new products is prioritised based on feedback from end users¹. It is also

¹ See the NCTS request submission page at <https://www.healthterminologies.gov.au/request>

based on a medicine's designated schedule², where Schedule 8 and 4 are prioritised over Schedule 3 and 2 medicines.

Use Cases

The AMT supports the following activities within the medication management cycle:

- Prescribing
- Recording
- Reviewing
- Issuing (including dispensing)
- Administering
- Transferring of information

These use cases are detailed in *AMTv4 - Requirements and Use Case Document* (Australian Digital Health Agency, 2024).

2.4.2 Out of scope

SNOMED CT (and AMT) is intended to describe the essential (necessary and always true) properties of its content. There is a wide range of knowledge about the prescribing and safe use of medicines that is not applicable to such a terminology. This information, including decision support tools, is available from knowledge base providers as either reference (look-up) or integrated data, and can usually be linked to the AMT.

Examples of information drawn from knowledge bases that are not (currently) within the scope of the AMT include:

- Adverse effects
- Cautionary and advisory label recommendations
- Contraindications
- Counselling instructions
- Dose checking
- Drug: Allergy interactions
- Drug: Drug interactions
- Drug: Food interactions
- Indications
- Normal dose ranges
- Physiological equivalence
- Precautions for use
- Storage or supply-chain information
- Product availability
- Route of administration for specific medicines
- Excipients

The exclusion of some of this information may be reviewed following stakeholder consultation with consideration of the utility, risk and identification of reliable data sources, and agreement by the relevant governance bodies.

² As described in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) at <https://www.tga.gov.au/publication/poisons-standard-susmp>.

3 SNOMED CT Background

3.1 Terminology Overview

AMT is a SNOMED CT terminology, and much of what is summarised below is detailed further in the SNOMED CT documentation, including:

- SNOMED CT Starter Guide³
- SNOMED CT Release File Specifications⁴
- SNOMED CT Logic Profile Specification⁵

SNOMED CT is a systematically organized computer-processable collection of **Concepts** relevant to healthcare. Every concept is represented by a unique immutable **Identifier** (code) and text **Descriptions**. Concepts are defined using description logic and related to one another through **Relationships**.

SNOMED CT content is organised in a relational model as shown in Figure 1

The hierarchies exist in a relational model, where each component of the model is shown in a box.

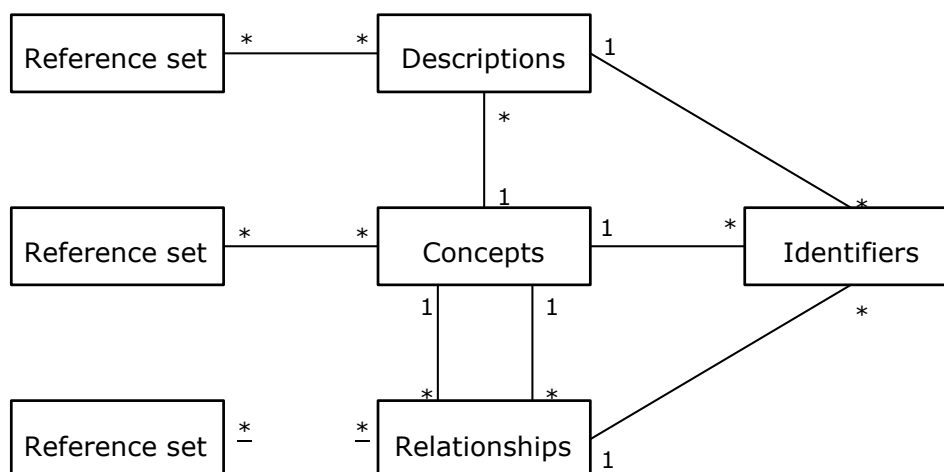


Figure 1: Basic SNOMED CT relational model

Reference Sets can be used to add customized information to these core components (Concepts, Descriptions and Relationships) or more commonly identify specific subsets of content.

3.2 Identifiers

Each component in SNOMED CT (and AMT) is assigned a unique identifier consisting of 6 to 18 digits. These identifiers remain constant for the components and do not convey any inherent meaning or hierarchical information.

³ [SNOMED CT Starter Guide - SNOMED CT Starter Guide - SNOMED Confluence \(ihtsdotools.org\)](#)

⁴ [SNOMED CT Release File Specifications - Release File Specification - SNOMED Confluence \(ihtsdotools.org\)](#)

⁵ [SNOMED CT Logic Profile Specification - SNOMED CT Logic Profile Specification - SNOMED Confluence \(ihtsdotools.org\)](#)

3.3 Descriptions

Descriptions provide a human-readable term for a given concept. They may be either a Fully Specified Name or a synonym. Synonyms may be further broken down into two types: the preferred synonym, which is known as the Preferred Term; and an acceptable synonym.

Fully Specified Name

The Fully Specified Name (FSN) is intended to provide an unambiguous way to identify that concept. The FSN may appear unnecessarily verbose compared to the most commonly used or natural phrase for that concept. Each FSN ends with a “semantic tag” in parentheses, which indicates the hierarchy’s name or the level within a hierarchy to which the concept belongs.

For example:

- Product containing ibuprofen (medicinal product)
- Panamax (paracetamol 500 mg) tablet, 50 tablets (branded clinical drug package)
- Gastro-resistant oral tablet (dose form)
- Flucloxacillin (substance)

All English FSNs will use en-US spelling.

Synonyms - Preferred Term

The Preferred Term (PT) is intended to capture the common word or phrase used by Australian clinicians to name that concept. Unlike FSNs, PTs are not necessarily unique. Occasionally, the synonym for one concept may also be a synonym for a different concept. For example, “ibuprofen” may be the PT for both a Medicinal Product concept and a Substance concept.

Synonyms - Acceptable synonym(s)

Additional terms may be available as acceptable synonyms to help users search for concepts. Acceptable synonyms are optional and not all concepts will have additional descriptions. Acceptable synonyms, like PTs, are not required to be unique across concepts.

3.4 Concepts

A "concept" refers to a clinical meaning identified by a unique numeric identifier that never changes. Each concept in SNOMED CT (and AMT) has a single unique human-readable Fully Specified Name (FSN) and one or more human-readable synonyms as described above. All concepts are formally defined based on their relationships with other concepts, known as "logical definitions." These logical definitions provide explicit meaning that can be processed and queried programmatically.

3.5 Relationships

Relationships play a crucial role in defining the connections between concepts. They describe how one concept is linked or related to another concept. Each relationship is directional, originating from a source concept and pointing towards a destination concept. Collectively, the relationships originating from a concept form a set of statements that establish the concept's meaning in relation to other concepts within the terminology.

The words “attributes” or “properties” may also be used interchangeably with “relationship”.

IS A relationships

In the SNOMED CT (and AMT) model, IS A relationships form the taxonomy or hierarchy, representing the main structure, of the terminology. They represent a subtype/supertype relationship between concepts, where one concept (child or subtype) is subsumed by another concept(s). All relationships true for the parent concept also hold true for the child concept, and the child concept is more specific than its parent(s) – either with additional relationships or refinements on those of its parent.

All active concepts (except the root, SNOMED CT) have at least one IS A relationship. Concepts can have multiple IS A relationships with other concepts (usually) within the same top-level hierarchy.

Other relationships (attributes)

Concepts can have other (non-“IS A”) relationships, which provide further definition and describing specific properties of the source concept. For example:

- Has active ingredient - provides the link between a product and substance concepts.
- Has manufactured dose form – provides a link between a product and a pharmaceutical dose form concept.

A concept may have zero to many attribute relationships. Concept models specify the relationships and associated rules (including the permissible source and destination concepts, cardinalities). Different concept models exist for different types of concepts within SNOMED CT, for example “Procedures” and “Clinical Findings” each have specific concept models^{6,7}.

Describing the AMT concept model is the primary focus of this document – see section 5.

3.6 Reference sets

Reference sets are a mechanism to either:

- Define subsets terminology components (almost always concepts) based on some criteria.
- Or provide additional information about them, not captured with relationships, including maps to other code systems.

It offers flexibility in supporting the evolution of SNOMED CT by allowing various extensions, linkages to other classifications and terminologies, and adding defining attributes to components.

The most common type of reference set is the "Simple type reference set," used for defining subsets. For example, the Medicinal Product reference set identifies all the AMT concepts from the Medicinal Product hierarchy.

Other reference set types provide additional information about specific components. They can include mapping between other code sets, text annotations or non-defining associations between unrelated concepts. Language reference sets are used to identify Preferred Terms and acceptable terms.

⁶ [DOM 71388002 Procedure - HRCM20230531 - SNOMED Confluence \(ihtsdotools.org\)](#)

⁷ [DOM 404684003 Clinical finding - HRCM20230531 - SNOMED Confluence \(ihtsdotools.org\)](#)

4 AMT v4 goals and design principles

The following design principles have been created to help guide the design process for AMT v4 migrating from AMT v3:

- 1 Unnecessary retirement of "7-box" concepts from AMT v3 are to be avoided migrating to AMT v4.
- 2 Align with the SNOMED International drug model, editorial rules, and content where possible and benefit can be delivered.
- 3 Adopt SNOMED International technical structures, such as SNOMED International's new Concrete Value File Specification⁸.
- 4 Pharmaceutical/biological product hierarchy should contain only medicines - other AMT product concepts (foods, devices, etc) should exist in appropriate hierarchies.
- 5 AMTv4 model and editorial rules shall be flexible enough to enable partial/incomplete modelling where appropriate for products to minimise effort and maximise content coverage where full modelling is of limited or no value.
- 6 AMTv4 model and editorial rules shall be flexible enough to not require all levels of abstraction for all products, for example for some products a primitive container trade product pack concept may be sufficient.
- 7 Editorial rules for modelling and naming shall be as simple as possible to meet the desired use cases.
- 8 Content will align as closely as possible to data in the TGA's Australian Register of Therapeutic Goods (ARTG).
- 9 Availability information may influence prioritisation but not AMT content modelled from the ARTG.
- 10 Fully specified names are comprehensive and unambiguous for reference use cases such as mapping and are not necessarily clinician friendly.
- 11 Preferred terms are clinician friendly and ideally, but not necessarily completely, unambiguous.

⁸ <https://confluence.ihtsdotools.org/display/DOCRELFMT/4.2.6+Concrete+Value+File+Specification>

5 Model specification

5.1 Overview

Concept models play a similar role for terminology as schemas do for relational data. A concept model specifies the pattern of logic used to define concepts within that domain. For example, concept models define rules for a hierarchy or group of hierarchies that govern:

- the types of relationships used to define concepts;
- the combinations and groupings of relationships used to define concepts.

This section explains the various elements of the AMT model, how they relate to one another and what can be expected of the data conforming to this model.

Please also refer to following documents as necessary:

- SNOMED CT-AU Guide for Terminology Use in Prescribing (Australian Digital Health Agency, 2016)
- SNOMED CT-AU Australian Technical Implementation Guide (Australian Digital Health Agency)- For technical guidance on how to implement the AMT and more detailed technical information.
- AMT Editorial and Naming Rules (Australian Digital Health Agency, 2024)- To understand the naming conventions of AMT descriptions and application of the modelling rules.

Discrete and Continuant Products

Medicinal products can generally be divided into two categories, based primarily on the physical form of the medicine.

Discrete Products : Tablets and capsules are the most common example. These are countable units of product, such that a package may contains “24” units. Strength is modelled as the total amount of active ingredient in each of these units.

Continuant Products: Are forms like liquid, cream, gas or powder. These forms are *boundless*, and packages of these products are some quantity “100 mL” or “250 grams”. The strength is modelled as a concentration of the active ingredient (agnostic of the packaged size).

Some products that have continuant forms, might be modelled as discrete due to limitations in the available information. Most notably, parenteral liquids packaged as specific doses without indication of the concentration and/or quantity.

5.2 Top-level hierarchies

The content within SNOMED CT is organised across numerous top-level hierarchies. Content applicable to AMT is available under the following:

- 373873005 | Pharmaceutical / biologic product (product) |
- 105590001 | Substance (substance) |
- 362981000 | Qualifier value (qualifier value) |

- 260787004 | Physical object (physical object) |

Various subtype classes exist under these top-level hierarchies. They represent concepts with various levels of granularity intended to support the different clinical use cases in eMedication management scenarios.

Figure 1 depicts the AMT clinical sub-hierarchy and how its subtype classes are structured. Each subtype class is described in more detail in later sections.

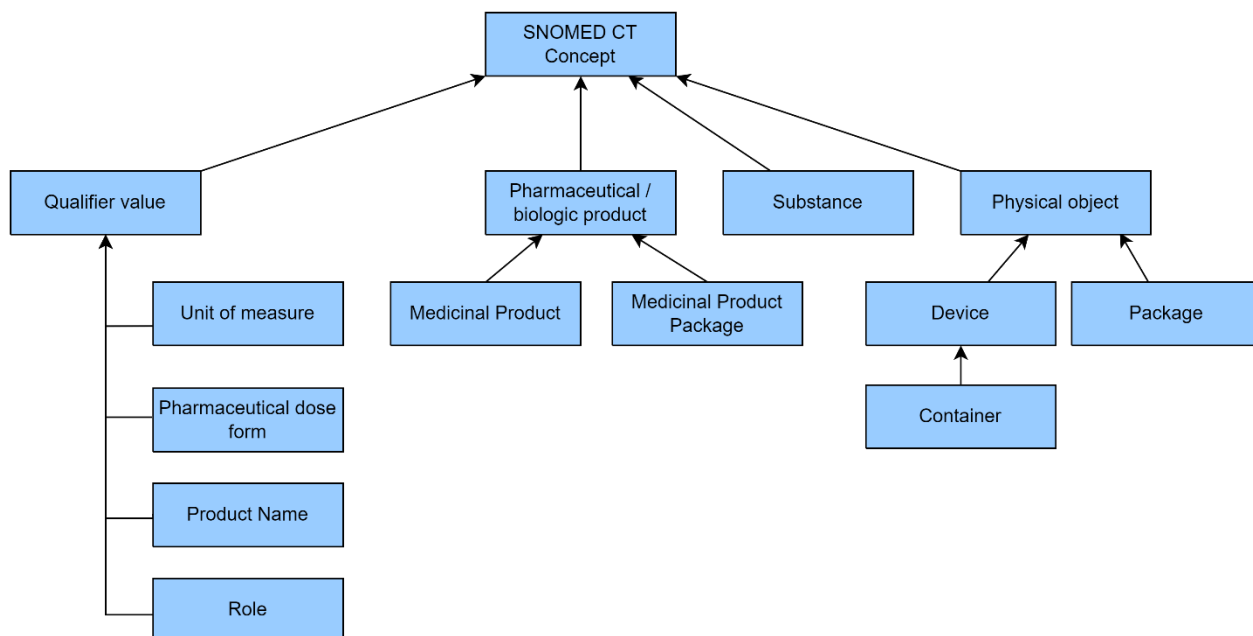


Figure 2: AMT v4 sub-hierarchy (of SNOMED CT-AU)

5.3 AMT model

The complete set of relationships between concepts within the AMT concept model is depicted in Figure 2 below. It depicts the AMT subtype classes, their subtype relationships and defining relationships (attributes).

Unlabelled attributes are IS A (subtype) relationships. All attributes are transitively available to subtypes; For example: Has BoSS is stated as a property of Clinical Drug, but also applies to the subtype Branded Clinical Drug.

Defining, numeric attributes for certain classes are not shown for clarity but accompany the four “Has Unit” properties. The AMT model is illustrated using the *SNOMED CT Diagramming Guideline*⁹.

⁹ [Diagramming Guideline - Diagramming Guideline - SNOMED Confluence \(ihtsdotools.org\)](#)

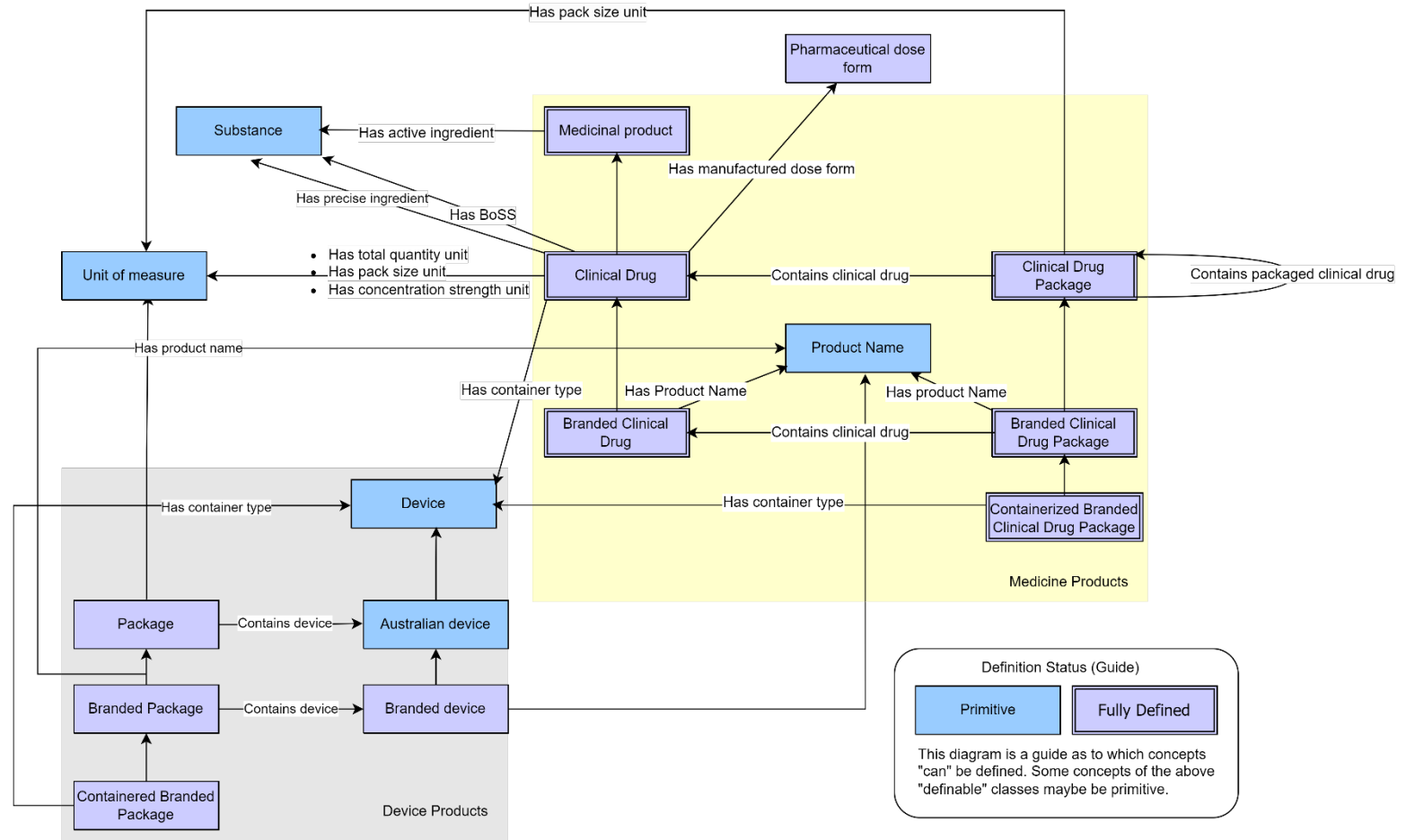


Figure 3: AMT Concept Model

Note: The entities above refer to concept classes, not specific concepts. Whilst actual concepts exist for the concepts shown in Figure 2; The others shown on Figure 3, are illustrative of the levels of specificity available, and relationships.

The AMT model can be understood from two perspectives.

- From the top, down – where each subtype introduces additional detail, and concepts become progressively more precise.
 - For medicines the Medicinal Product concept should be considered the top.
 - For devices, the Device concepts may be regarded as the top.
- From the bottom upwards.
 - For medicines the Containerised Branded Clinical Drug Package concepts are the most specific concepts, aligning with marketed products.
 - For devices, the Containerised Packages are the most specific.

Taking the reader from the concepts representing the physical real world, packaged entities steadily up to higher levels of abstraction.

AMT uses a variety of relationship types when connecting two concepts. Relationship types or concept attributes are used to represent logical statements or definitions of concepts.

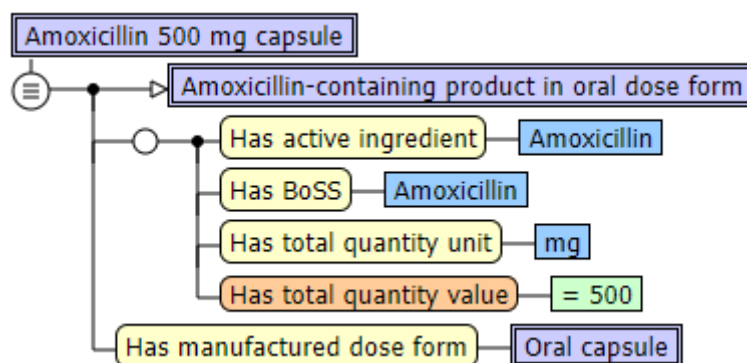
Examples are IS A, HAS BoSS and HAS ACTIVE INGREDIENT relationships. The IS A relationship is used to represent a subtype relationship, where the source concept of an IS A relationship is the subtype concept and the destination concept is its supertype concept.

For example | Panadol 500 mg tablet | *IS A subtype of* | Paracetamol 500 mg tablet |.

All defining statements that are true of a supertype concept are true of the subtype concept i.e. the subtype concept inherits all its supertype's attributes. All other relationship types in AMT (that are not IS A) are defining attributes that explicitly represent each defining characteristic of a class. Taken together, the set of inherited and defining attributes helps to fully define a particular concept in the terminology.

Figure 3 shows an AMT Clinical Drug (CD) concept | Amoxicillin 500 mg capsule | with its set of defining relationships, which uniquely characterises the concept in relation to other concepts in the AMT.

Figure 4: Example CD concept diagram



5.4 Notable concept reference sets

A significant part of AMT has been the seven notable reference sets, namely:

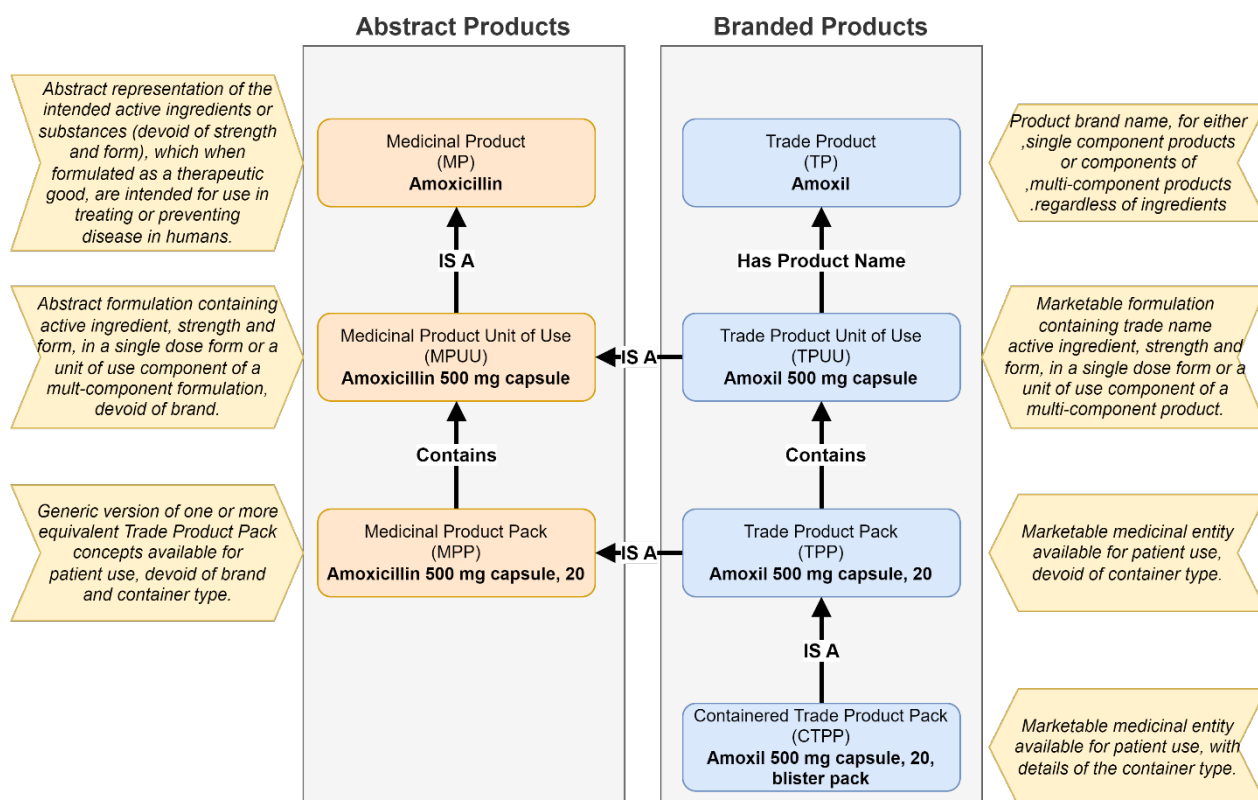
- Medicinal product (MP)

- Medicinal product unit of use (MPUU)
- Medicinal product pack (MPP)
- Trade product (TP)
- Trade product unit of use (TPUU)
- Trade product pack (TPP)
- Containered trade product pack (CTPP)

These reference sets represent different abstractions of branded products and their generic product equivalents at various levels of granularity. Traditionally in AMT, these reference sets were simply subtypes of the v3 concept classes. In AMTv4 the reference sets still capture the same levels of abstraction (and concepts) as v3, but the reference sets and concept classes have been uncoupled.

Figure 5 describes these reference sets, along with offering brief definitions and a simple product example.

Figure 5: Seven notable AMT reference sets and their definitions



As mentioned, in AMTv4 these reference sets are uncoupled from specific concept classes, and whilst each identifies concepts of the same specificity (compared to AMTv3) – the concepts may not share the same concept class; most notably for non-medicine products. The specific types of concepts currently in each reference set are described below. The described inclusion criteria may be revised to respond to changes in modelled content such that the concepts included meet the above definitions.

Reference set	Logic Criteria
Medicinal Product	For Medicines: The closest ancestors of members of the MPUU reference set NOT having a <i>Has manufactured dose form</i> attribute For Devices: The concepts representing the general composition of the device.
Medicinal Product Unit of Use	All concepts that are referenced by one of these attributes: - Contains clinical drug, OR - Contains packaged clinical drug OR - Contains device AND NOT having the following attributes: - Has product name;
Medicinal Product Pack	All concepts having the following attributes: - Contains clinical drug, OR - Contains packaged clinical drug OR - Contains device AND NOT having the following attributes: - Has product name;
Trade Product	All subtypes of the <i>Product Name</i> concept
Trade Product Unit of Use	All concepts having the following attributes: - Has product name; AND NOT with the following attributes - Contains clinical drug, OR - Contains packaged clinical drug OR - Contains device
Trade Product Pack	All concepts with the following attributes: - Has product name; AND - Contains clinical drug, OR - Contains packaged clinical drug OR - Contains device
Containerized Trade Product Pack	All concepts with the following attributes: - Has product name; AND - Contains clinical drug, OR - Contains packaged clinical drug OR - Contains device AND - Has container type;

The ECL constraints for the notable reference sets are detailed in A.2 below.

5.5 Defining value concepts

AMT product concepts are defined by a combination of attributes, and concepts from across the terminology (including other product concepts).

5.5.1 Substances

The SNOMED CT *Substance* hierarchy (<105590001) provides concepts to identify chemical elements, compounds and mixtures for the target of the following properties within AMT:

- Has active ingredient
- Has precise active ingredient
- Has basis of strength substance

Further information is available in [Substance - SNOMED CT Editorial Guide - SNOMED Confluence \(ihtsdotools.org\)](https://www.itsdotools.org/).

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has disposition	<< 726711005 Disposition	0..*	0..0	This attribute enables the creation of an association between a substance concept and a disposition (A disposition is defined as a behaviour that a substance will exhibit or participate in, given the appropriate context)
Is modification of	<< 105590001 Substance	0..*	0..0	This attribute indicates that the concept is a structural modification of another concept.

5.5.2 Units of Measure

The SNOMED CT *Unit of measure* hierarchy (<767524001) provides concepts to represent the units used to measure quantities and magnitudes associated with AMT products. They are used as the target for the following properties within AMT:

- Has numerator unit
- Has denominator unit
- Has concentration strength unit
- Has total quantity unit
- Has pack size unit

Examples are:

- 258684004 |mg|
- 258773002 |mL|
- 773741000168107 |Antigen unit|
- 258798001| mg/mL|

Unit of measure concepts may also be subtypes of other Unit of measure concepts, forming a hierarchy. For example, 258684004|mg| is a subtype of 258680008 | Unit of mass |.

Units of measure used by AMT are aligned with the TGA Approved Terminology for Medicines.

This hierarchy also includes units of measure known as “composite units of measure”. A Composite unit of measure is used to express units that have a numerator and denominator component.

Composite unit of measure concepts have:

exactly one HAS NUMERATOR UNIT relationship to a Unit of measure concept; and

exactly one HAS DENOMINATOR UNIT relationship to a Unit of measure concept.

Composite units are used to describe concentration, rates or density.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality
HAS NUMERATOR UNIT	<<767524001 Unit of measure	0..1	1..1
HAS DENOMINATOR UNIT	<<767524001 Unit of measure	0..1	1..1

5.5.3 Pharmaceutical dose form

The SNOMED CT *Pharmaceutical dose form* (Forms) hierarchy (<736542009) provides concepts to represent a product’s original dose form, when it is first manufactured (such as tablet, capsule, or eye drop).

Form concepts may also be subtypes of other Form concepts. For example, 421026006|Oral tablet| is a subtype of 385268001|Oral dose form|.

Forms are generally aligned with the TGA Approved Terminology for Medicines.

The SNOMED CT concept model for Pharmaceutical dose form is summarised in Table 1 below. For further details see the *Pharmaceutical Dose Form Naming and Modelling Conventions* (SNOMED International, 2024).

Table 1: Pharmaceutical dose form attributes

Attribute	Allowable range	Cardinality	In Group Cardinality	Details
Has basic dose form	<736478001 Basic dose form	0..1	0..0	
Has dose form intended site	<736479009 Dose form intended site	0..*	0..0	
Has dose form release characteristic	<736480007 Dose form release characteristic	0..1	0..0	
Has dose form administration method	<736665006 Dose form administration method	0..*	0..0	
Has dose form transformation	<736477006 Dose form transformation	0..*	0..0	

The administered dose form of medicines is not represented for AMT products, where this is different to the manufactured dose form. For example, the product |*Lemsip Max Flu Strength Daytime powder for oral liquid, 1 sachet*| has a manufactured dose form of |powder for oral liquid| but when reconstituted for use before or upon administration will have an administered dose form of |oral liquid solution|.

5.5.4 Container Type

AMT Container type concepts represent the types of containers that immediately cover a medicine's dose form. Examples include:

- 469844003 |Ampoule|
- 463792004 |Medicine bottle|
- 712625003 |Eye dropper bottle|
- 307011000036101 |Vial|
- 464557001|Parenteral/enteral solution bag|

Multi-component products with multiple different packaging, are simply designated with a generic 706437002|Container|.

Similarly, packs where the individual (Branded) Clinical Drug are already in some specific container are also modelled with the generic 706437002|Container| concept.

Container-type concepts may also be subtypes of other Container type concepts. For example, 51916011000036104 |dispensing bottle| is a subtype of 463792004 |Medicine bottle|.

Container-type concepts are mostly derived from the TGA Approved Terminology for Medicines.

5.6 Medicinal Product (MP)

Medicinal Product (MP) is within SNOMED CT is a high level of abstraction describing therapeutic products by any combination of

- Manufactured dose form
- Active (moiety) ingredient combination

The following table lists the attributes of the MP class, each attribute's allowable range of concepts, whether they are mandatory or optional and some details of each attribute.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has active ingredient	<< 105590001 Substance (substance)	0..*	1..1	Represents the active ingredient(s) of the abstract product that provides the intended therapeutic effect. The AMT does not currently model excipient ingredients of products. All attributes are individually grouped (on their own).
Has manufactured dose form	<< 736542009 Pharmaceutical dose form (dose form)	0..1	0..0	This attribute describes a grouping dose form concept for the medicinal product, where the grouping is the intended site for administration of the dose form of the product. MPs with this property are not actively modelled in AMT, but appear within the hierarchy, inherited from core content.
Count of base of active ingredient	Integer	0..1	0..0	Used to simulate closed world "containing only" description logic. AMT does not use this restriction within the MP class.

Medicinal Product containing Concept (MP-containing)

Traditionally within AMTv3, Medicinal Product referred only to a single (or combination of) active moiety intended for use as a therapeutic product; For example: | Paracetamol + codeine |. These concepts only use the Has active ingredient property and still exist. Those applicable to AMTv4 are identifiable through the Medicinal Product reference set.

For brevity, when referring to Medicinal Products (MP) concepts in the context of AMT, it is these concepts that are being referred to. MP-Only, MPF and MPR (and combinations of) described below, will always be referred to specifically, and are not members of the Medicinal Product reference set.

Medicinal Product Only Concept (MP-Only)

The open-world logic used in AMTv3 (and the rest of SNOMED CT) continues with AMTv4 MP concepts. Such that | Paracetamol + codeine | is a product that "contains at least" Paracetamol and codeine". These concepts may subsume other MPs that contain additional ingredients.

SNOMED International also include concepts that represent the closed world semantics of “contains only”. These concepts only subsume concepts that have the same set of ingredients, not anything extra. These concepts are not members of the AMT Medicinal Product reference set or maintained as part of AMT. More details on the logic semantics is available in the *Model for the representation of Medicinal Products in SNOMED CT* (SNOMED International, 2021).

Currently no AMT concepts are subsumed by MP-Only concepts.

Medicinal Product Form (MPF)

Medicinal Product Form is an abstract representation of a medicinal product described by its active ingredients and dose form concept without reference to any product strength. Examples include:

- 350121009 | Gentamicin-containing product in parenteral dose form |
- 771792001 | Nicotine-containing product in cutaneous dose form |

This concept class is inherited from the SNOMED International Drug Model¹⁰ and with the initial content provided by in the core SNOMED CT release, and limited to grouping dose form concepts that are the immediate children of 736542009_ | Pharmaceutical dose form (dose form) |. These dose forms are typically high-level form abstractions describing a single property (as described in 5.5.3 above) e.g. “Has dose form intended site”.

It is expected that SNOMED CT-AU will introduce additional MPF concepts over time in response to stakeholder requirements. Alternatively, AMTv4 may introduce additional groupers to meet the requirements of Australian use cases.

Combinations

It is possible to use any combination of properties to provide a myriad variety of abstractions for Medicinal Products.

Concept	Has active ingredient	Has manufactured dose form
Tetracycline-containing product in oral dose form	✓	✓
Tetracycline-containing product	✓	
Product manufactured as oral dose form		✓

Note: Not all possible combinations will exist in the terminology. SNOMED CT-AU may introduce new groupers as required, and as is relevant to genuine use cases. In the context of AMT, “MPs” are synonymous with *members of the Medicinal Product reference set*; which does not include concepts with *has manufactured dose form* and only includes concepts with ingredient combinations relevant to AMT and based on open world description logic. The MPs are the integration point between AMT and the SNOMED International Drug Model.

Concept	AMT MP
27658006 Product containing amoxicillin (medicinal product)	✓
774586009 Product containing only amoxicillin (medicinal product)	✗

¹⁰ [Medicinal Product Form \(MPF\) - Medicinal Product Model - SNOMED Confluence \(ihtsdotools.org\)](https://ihtsdotools.org/)

440131009 Product manufactured as oral dose form (product)	✗
350162003 Product containing amoxicillin in oral dose form (medicinal product form)	✗

5.7 Clinical Drug (CD)

Clinical Drug (CD) concepts represent a generic (devoid of a brand) abstraction of medicinal products. Ideally describing the active ingredients, strength, and form of products. An example CD concept is 23628011000036109 |Paracetamol 500 mg tablet|.

The following table lists the attributes of the CD class, each attribute’s allowable range of concepts, whether they are mandatory or optional and some details of each attribute.

A CD is the most complex component of the AMT v4 model. There are some modelling considerations that depend on the specific product type being modelled. Specific details of how to model different product types are described in detail in the *AMT v4 Editorial and Naming Conventions* (Australian Digital Health Agency, 2024).

Table 2: Clinical Drug attribute summary

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has active ingredient	< 105590001 Substance	1..*	1..1	Represents the active ingredient(s) of the abstract product that provides the intended therapeutic effect. The AMT does not currently model excipient ingredients of products. All attributes are individually grouped (on their own).
Has basis of strength substance	< 105590001 Substance	0..*	0..1	The basis of strength substance (BoSS) corresponds to the strength of a product as reported in official product documentation, such as Australian registration details and product information document, as developed by the product sponsor in collaboration with the TGA. BoSS is not included if a product does not have a logical strength or concentration attribute (such as non-medicated dressings). The definition of a BoSS is more fully described in the AMT Editorial Rules (Australian Digital Health Agency, 2024). The BoSS is always interpreted together with the Intended active ingredient attribute.
Has concentration strength value	DEC (decimal)	0..*	0..1	The concentration of BoSS in a continuant product
Has concentration strength unit	< 767524001 Unit of measure	0..*	0..1	Only present if there is also Has BoSS attribute
Has total quantity value	DEC (decimal)	0..*	0..1	The total quantity of basis of strength substance (BoSS).
Has total quantity unit	< 767524001 Unit of measure	0..*	0..1	For continuant forms, this is the strength (concentration) multiplied by the pack size. For discrete forms, this is the “unit strength”. Only present if there is also Has BoSS attribute Only present for continuant forms if there is also a pack size.
Has pack size value	DEC (decimal)	0..1	0..1	This is the quantity of <i>product</i> (not ingredient) that is in the unit of presentation.
Has pack size unit	< 767524001 Unit of measure	0..1	0..1	

				The quantity of product is inclusive of diluent or other such substrate (specified or not) that makes up the product.
Has manufactured dose form	< 736542009 Pharmaceutical dose form	1..1	0..0	This attribute describes a grouping dose form concept for the medicinal product, where the grouping is the intended site for administration of the dose form of the product
Has container type	<< 706437002 Container	0..1	0..0	The type of container the clinical drug is supplied in.

CD concepts have 3 pairs of attributes representing concrete domains, each pair describing a numeric value and associated unit of measure:

- Has concentration strength
- Has total quantity
- Has pack size

These are organised into two role groups for CD concepts:

- Strength role group – A distinct role group may exist for every specific active ingredient in a product. The composition of the role group depends on the type of product, as described in the following section.
- Pack size role group – A single role group exists to describe the size of a single presentation unit of a continuant product. For example some quantity of liquid (in a vial).

Strength role group

A strength role group is created for each specific active ingredient in a product if it is clinically relevant. The product's strength is always interpreted alongside the BoSS attribute as documented officially. Most CD concepts have a specified Strength attribute, but it is not included if a product lacks a logical strength or concentration attribute (e.g., “Water for injection”).

- For discrete products, such as tablets and suppositories, the “strength” is described as the “**Total quantity**” of BoSS in each unit.
- For continuant products such as liquids, creams and powders. Strength is usually described as a “concentration” of BoSS using the “**Has strength**” attribute pair (value and units). The units of measure are always a composite, with the denominator being a mass or volume unit of measure.
- Continuant dose form CD concepts that also have a pack size role group, will also have a “total quantity” attribute pair. That is calculated as the concentration multiplied but the pack size.
- Some continuant forms are modelled with only a “Total quantity” when the concentration is unknown or not published. Where a Pack size is provided, AMT will not “reverse engineer” the concentration.
- Transdermal patches will be modelled with a strength where the denominator is a specific unit of time E.g. “14 mg/24hr”.

Strength and terms

The modelled strength of CD concepts may differ from the strength preferred term. Strengths are generally modelled using:

- A normalised unit - milligram or millilitre, for mass or volume respectively.
(For substances where milligram is not applicable, suitable alternative units are used)

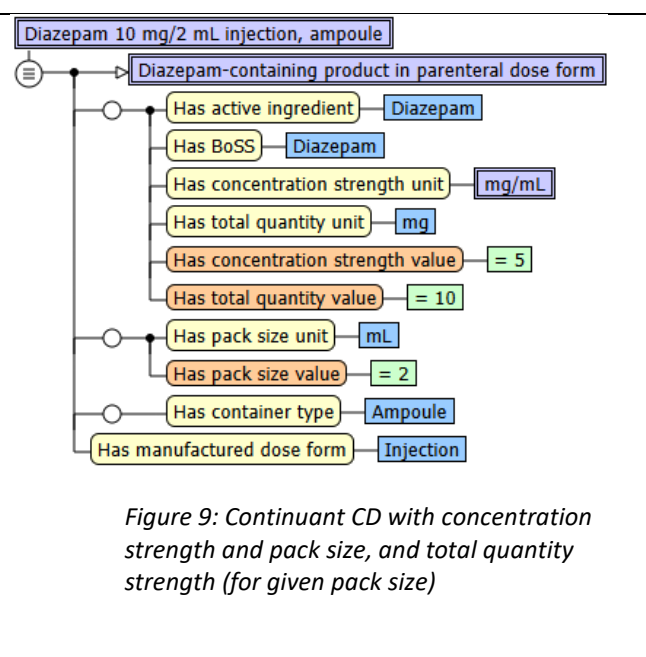
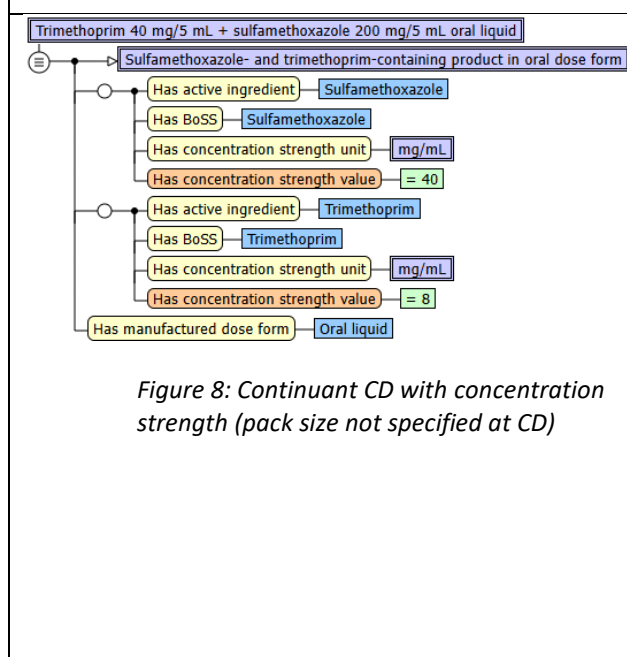
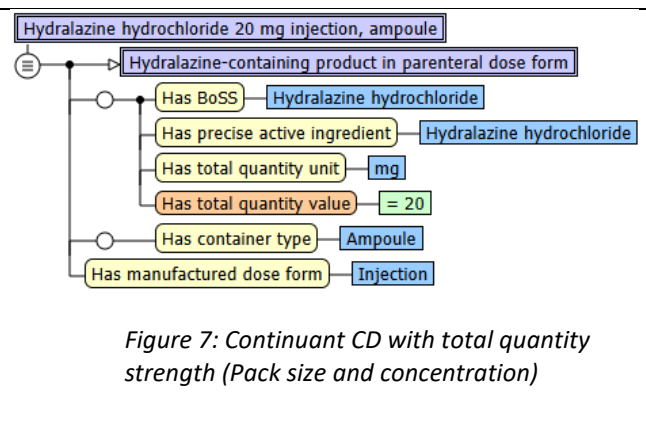
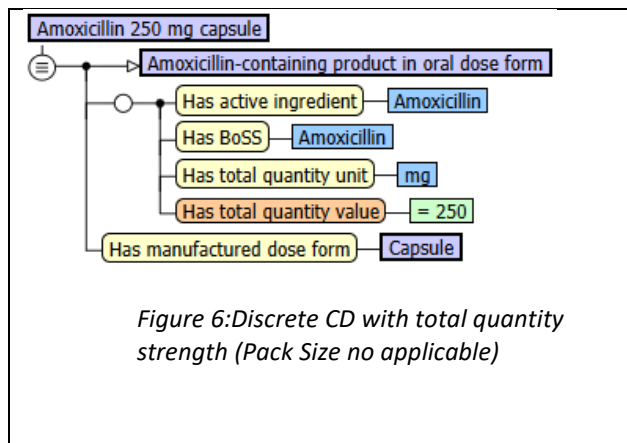
- A normalised concentration (denominator of 1). E.g. 2.5mg/mL rather than 5mg/2mL.

This modelling approach is taken to support predictable machine processing allowing for easier computational tasks and queries. Such as comparing the strengths of related products.

On the other hand, the preferred terms for these concepts are designed to be user-friendly and may include units of measurement and associated values based on clinical preferences or safe medication usage recommendations.

Pack Size Role Group

The pack size role group expresses the total size or quantity of the product represented by the concept. This is not expressed for discrete products (for example tablets) where the size is not known or relevant. This is expressed for continuous products that have a concentration strength in pre-packaged quantities. For example “2mL vial, of 2.5mg/mL product”.



5.8 Clinical Drug Package (CDP)

Clinical Drug Package (CDP) concepts represent an abstraction of a packaged medicinal product available for patient use, agnostic of the brand. They represent the quantity of CD concepts found within the package for supply chain purposes. An example of a CDP concept is 46259011000036105 |Paracetamol 500 mg tablet, 20| - A pack containing 20 tablets.

The following table lists the attributes of the CDP class, each attribute's allowable range of concepts, whether they are mandatory or optional and some details of each attribute.

All attributes for CDP are grouped, and each CD has at least one group (set) of attributes.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Contains clinical drug	Clinical Drug	1..*	1..1	References CD concepts contained within the pack
Has pack size value	DEC (decimal)	0..*	0..1	Represents the quantity of the associated APP within the package. Always interpreted together with the grouped Contains packaged clinical drug attribute.
Has pack size unit	< 767524001 Unit of measure	0..*	0..1	
Count of contained component ingredient	Integer	1..*	1..1	Count of the number of ingredient role groups are in the product. Used in description logic classification to simulate closed-world assumption description logic ¹¹ .
Count of clinical drug type	Integer	1..1	0..0	Count of the number of unique Clinical Drugs in the product. Used in description logic classification to simulate closed-world assumption description logic ¹² . Such that all pack concepts (of the same specificity) within AMT are disjoint.

5.8.1 Multipacks and Combination products

CDP concepts also encompass multipacks and combination products. These are medicinal products that consist of multiple other CDPs - either a single CDP or a combination of different CDP concepts. For example, a package containing fluconazole oral capsules and clotrimazole cream. In such cases, the pack size information for each component product within the package is grouped together.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Contains packaged clinical drug	<< 781405001 Medicinal product package	1..*	1..1	References CDP concepts contained within the multipack
Has pack size value	DEC (decimal)	0..*	0..1	

¹¹ [Closed-world assumption - Wikipedia](#)

¹² [Closed-world assumption - Wikipedia](#)

				Represents the quantity of the associated CDP within the package.
Has pack size unit	732935002 Each	0..*	0..1	Always interpreted together with the grouped Contains packaged clinical drug attribute.
Count of contained package types	Integer	1..1	0..0	Count of the number of unique Clinical Drug Packs in the product. Used in description logic classification to simulate closed-world assumption description logic ¹³ . Such that all pack concepts (of the same specificity) within AMT are disjoint.

- The *Has pack size unit* always |Each| represents a count (integer) of CDPs
Note the datatype is Decimal, as this property is used for CDPs also.
- The Contains packaged clinical drug, and Has pack size attributes are always grouped, with only one instance of each within a group.

5.9 Product Names

The Product Names are simple concepts used to identify the specific brand name (including “Generic” or “House Brands”) of products. They are directly analogous to Trade Product concepts (TPs) from AMTv3. All members of the Trade Product (TP) reference set are Product Name concepts.

Examples of Product Name concepts include:

- Panadeine Forte
- Augmentin
- Advil Mini Caps
- Ezetimibe (Sandoz)
- Nesina Met 12.5 mg/1000 mg
- Ibuprofen (Herron Blue)

For the **AMT v4**, Trade Product Names are simply modelled as subtypes of 774167006| Product name (product name)|, within the Qualifier value subhierarchy. And **are nothing more than a string with a concept identifier**.

The exact scope and purpose of the Trade Product class has traditionally been ambiguous in AMT v3; Trade Product concepts inconsistently included details about (or allusions to) form, strength and ingredient combinations. Determining a precise definition and purpose for this concept class was deferred after stakeholder consultation and will be scheduled on the post-production AMTv4 roadmap. The variability present in AMTv3 persists in AMTv4 for now.

¹³ [Closed-world assumption - Wikipedia](#)

5.10 Branded Clinical Drug (BCD)

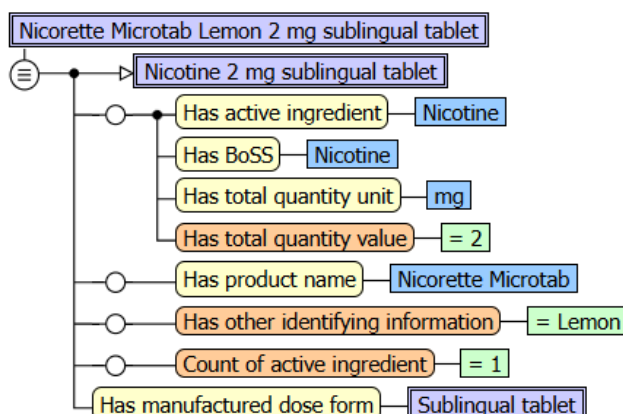
The Branded Clinical Drug (BCD) class represents a marketable formulation. It is a specific branded version of a CD containing all the same properties, with the addition of three new attributes.

The following table lists the additional attributes specific to BCD class - on top of those previously described for Clinical Drug (CD) above.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has product name	< 774167006 Product name	1..1	0..0	Concept brand name.
Has other identifying information	String	1..*	0..0	String value, describing additional information not otherwise captured within the current concept model. Default value = "None"
Count of active ingredient	Integer	1..1	0..0	Count of the number of ingredient role groups are in the product. Used in description logic classification to simulate closed-world assumption description logic ¹⁴ .

Additionally, The BCD class is a subtype of the CD class and therefore inherits all the properties described for CD 5.7 above.

Figure 10: Example BCD 933219751000036109 /Nicorette Microtab Lemon 2 mg sublingual tablet/



¹⁴ [Closed-world assumption - Wikipedia](#)

5.11 Branded Clinical Drug Package (BCDP)

Branded Clinical Drug Package (BCDP) represents the packs of marketable medicinal entities available for patient use, devoid of greater container type.

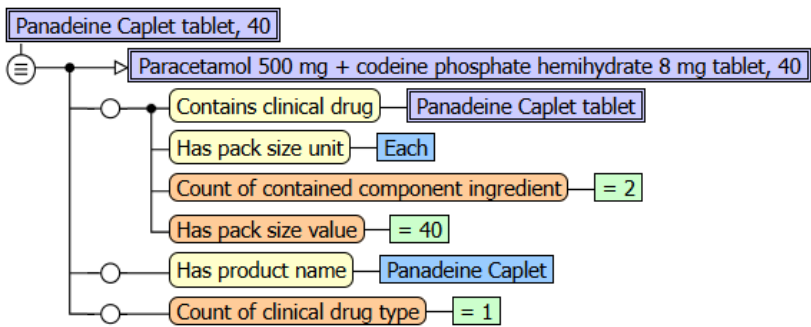
A BCDP concept is a branded counterpart of a CDP concept. An example BCDP concept is 57348011000036102 |*Paracetamol (Herron) 500 mg tablet, 20*|.

The following table lists the attributes specific to BCD class.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has product name	< 774167006 Product name	1..1	0..0	Concept brand name.
Count of clinical drug type	Integer	1..1	0..0	Count of the number of unique Branded Clinical Drugs in the product. A refinement of the parent Clinical Drug Package concept.
Contains clinical drug	<< 30425011000036101 Branded Clinical Drug	1..*	1..1	References BCD concepts contained within the pack
Has pack size value	DEC (decimal)	0..*	0..1	Represents the quantity of the associated CDP within the package.
Has pack size unit	< 767524001 Unit of measure	0..*	0..1	Always interpreted together with the grouped Contains packaged clinical drug attribute.

The BCDP class is a subtype of the CDP class and therefore inherits all the properties described for CDP in 5.8 above. However, the *Contains clinical drug* property is refined to only reference *Branded Clinical Drugs* concepts.

Figure 11: Example BCDP 653021000168106| *Panadeine Caplet tablet, 40* |



5.11.1 Trade Multipack

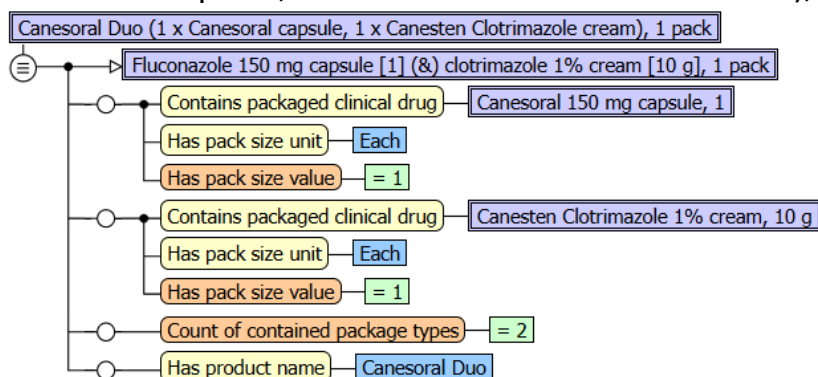
The Multipack BCDPs represent packs that are composed of multiple BCDPs. The BCDPs may be multiple quantities of a single BCDP, or any quantity of a combination of BCDPs.

For example, a package containing fluconazole oral capsules and clotrimazole cream. In such cases, the pack size information for each component product within the package is grouped together.

Again, all attributes described for Multipacks apply with the addition of the “Has product name” as described below. The range of concepts referenced by the *Contains packaged clinical drug* attribute is refined to only BCDP concepts.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has product name	< 774167006 Product name	1..1	0..0	Concept brand name.
Count of contained package types	Integer	1..1	0..0	Count of the number of unique Branded Clinical Drug Packs in the product.
Contains packaged clinical drug	<< 929360041000036105 Branded Clinical Drug Package	1..*	1..1	References BCDP concepts contained within the multipack
Has pack size value	DEC (decimal)	0..*	0..1	Represents the quantity of the associated CDP within the package.
Has pack size unit	< 767524001_ Unit of measure	0..*	0..1	Always interpreted together with the grouped Contains packaged clinical drug attribute.

An example of a Trade Multipack is 56200011000036104 | Canesoral Duo (1 x Canesoral capsule, 1 x Canesten Clotrimazole cream), 1 pack |



5.12 Containerized Branded Clinical Drug Packaged (CBCDP)

The Containerized Branded Clinical Drug Packaged (CBCDP) represents the marketable medicinal entity available for patient use, with details of the container type. Its attributes include the brand, the types and number of units it contains, and container type. The CBCDP is the most granular product concept in the AMT concept model.

A CBCDP concept is a branded counterpart of a CDP concept with the addition of a container-type attribute. An example CBCDP concept is 61328011000036103 | *Paracetamol (Herron) 500 mg tablet, 20, blister pack* |.

A CBCDP describes a specific packing of a BCDP, and is thus a subtype, inheriting all properties.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has product name	< 774167006 Product name	1..1	0..0	Concept brand name.

Has container type	<< 706437002 Container	1..1	0..0	The type of container the clinical drug is supplied in.
Contains clinical drug	<< 30425011000036101 Branded Clinical Drug	1..*	1..1	References BCD concepts contained within the pack
Has pack size value	DEC (decimal)	0..*	0..1	Represents the quantity of the associated CDP within the package.
Has pack size unit	< 767524001_ Unit of measure	0..*	0..1	Always interpreted together with the grouped Contains packaged clinical drug attribute.

Optionally, a CBCDP may be mapped to one or more Australian Register of Therapeutic Goods Identifiers (ARTG Ids), as described by the ARTG ID reference set in the 7 below.

5.12.1 Containered Multipacks

The Combination CBCDPs represent packs that are composed of multiple CBCDPs. The CBCDPs may be multiple quantities of a single CBCDP, or any quantity of a combination of CBCDPs.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has product name	< 774167006 Product name	1..1	0..0	Concept brand name.
Has container type	<< 706437002 Container	1..1	0..0	The type of container the clinical drug is supplied in.
Contains packaged clinical drug	<< 30537011000036101 Containered Branded Clinical Drug Packaged	1..*	1..1	References CBCDP concepts contained within the multipack
Has pack size value	DEC (decimal)	0..*	0..1	Represents the quantity of the associated CDP within the package.
Has pack size unit	< 767524001_ Unit of measure	0..*	0..1	Always interpreted together with the grouped Contains packaged clinical drug attribute.

- There is no specific “has units” attribute, as the pack size represents a simple integer count.
- The Contains packaged clinical drug, and Has pack size attributes are always grouped, with only one instance of each within a group.

6 Non-Medicinal Products and Devices

6.1 Devices

AMT_v4 removes non-medicinal products and devices from the medicinal product hierarchy and models them within the top-level SNOMED CT hierarchy 49062001 | Device (physical object) |. Currently, these products are mostly bandages and diagnostic reagents referenced by the PBS and RPBS. Examples include:

- Copper sulfate compound diagnostic tablet
- Glucose indicator blood diagnostic strip
- Dressing hydrofibre with silver 15 cm x 15 cm dressing
- Salicylic acid 40% medicated dressing

There are many types of devices used in health care and there is currently no single unifying model to describe them all. Most device concepts are unmodelled, however (at least) three tiers of specificity for each device are available through AMT; each adjacent to the next through the ISA hierarchy.

Device	Australian device	Trade device
dressing hydrofibre alternate to alginates	dressing hydrofibre alternate to alginates 2 cm x 45 cm ribbon	Aquacel (403770) 2 cm x 45 cm ribbon
bandage calico bandage calico	bandage calico large triangular bandage	Handy Calico (5608) large triangular bandage
glucose indicator blood	glucose indicator blood diagnostic strip	Betachek diagnostic strip
Glucose indicator urine	copper sulfate compound diagnostic tablet	Clinitest compound diagnostic tablet

A comprehensive devices model will be considered for a future AMT roadmap, following the release of AMT_v4. For now, the legacy content from AMT_v3 has been migrated across into the following classes.

Branded physical object

Analogous to the BCD, these are specific branded devices identified by the “Has product name” property. These will be leaf node concepts, found at the very bottom of the hierarchy and are terminal (have no subtypes). Trade device concepts are included in the TPUU reference set.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
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Has product name	< 774167006 Product name	1..1	0..0	Concept brand name.
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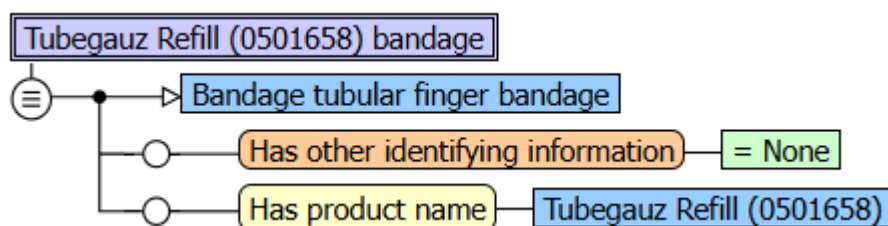


Figure 12: Branded Device example 48519011000036103 | Tubegauz Refill (0501658) bandage |

Physical Object

The immediate supertype of Branded physical object concepts are simply Physical Objects. Like their Clinical Drug analogue, they represent an abstraction of the Trade device, agnostic of the brand. Although there is currently no modelling for most of these concepts, their terms describe assorted sizes and compositions of devices. Physical objects that are relevant to Branded Physical Object concepts are included in the MPUU reference set.

Device

Although multiple other levels of abstraction exist, the immediate supertype (parent) concepts of Australian devices are analogous to the Medicinal Product-containing class. These concepts describe different devices, at a level that does not include details about size. Concepts are usually differentiated by a single (anonymous) property such as composition or general type. Physical objects that are considered Device concepts relevant to AMT are included in the MP reference set.

6.2 Medicated Devices

Medicated devices are a special subset of devices that straddle both the device and medicinal product hierarchies. These concepts are subtypes of 411115002 | Drug-device combination product | and described products such as medicated implants, transdermal patches, and dressings.

Branded Clinical Drug / Device	Clinical Drug / Device	Medicinal Product
Nicorette Invisipatch 25 mg/16 hours patch	nicotine 25 mg/16 hours patch	nicotine
Vitrasert 4.5 mg implant	ganciclovir 4.5 mg implant	ganciclovir
Wart Removal System (Scholl) Fabric 40% medicated dressing, application	salicylic acid 40% dressing, application	salicylic acid

The model for these concepts is much the same as for Clinical Drug with the following differences:

- “Has manufactured dose form” property is replaced by a “Has device type”
- No pack size role group.
- No “Has container type” property.
- Concepts have either a “Has strength” or “Has total quantity” attribute pair. Not both.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has active ingredient	< 105590001 Substance	1..*	1..1	Represents the active ingredient(s) of the abstract product that provides the intended therapeutic effect. The AMT does not currently model excipient ingredients of products. All attributes are individually grouped (on their own).
Has basis of strength substance	< 105590001 Substance	0..*	0..1	The basis of strength substance (BoSS) corresponds to the strength of a product as reported in official product documentation, such as Australian registration details and product information document, as developed by the product sponsor in collaboration with the TGA. BoSS is not included if a product does not have a logical strength or concentration attribute (such as non-medicated dressings). The definition of a BoSS is more fully described in the AMT Editorial Rules (Australian Digital Health Agency, 2024). The BoSS is always interpreted together with the Intended active ingredient attribute.
Has concentration strength value	DEC (decimal)	0..*	0..1	The concentration of BoSS in a device is either a “release rate” or “density concentration”. Only present if there is also Has BoSS attribute
Has concentration strength unit	< 767524001 Unit of measure	0..*	0..1	
Has total quantity value	DEC (decimal)	0..*	0..1	The total quantity of basis of strength substance (BoSS) in a device. Only present if there is also Has BoSS attribute. Not present if “Has strength” is used.
Has total quantity unit	< 767524001 Unit of measure	0..*	0..1	
Has device type	< 49062001 Device	1..1	0..0	This attribute describes a grouping dose form concept for the medicinal product, where the grouping is the intended site for administration of the dose form of the product

6.3 Package

The Package concept class describes packs of devices. It is analogous to the PCD concept for medicinal products differing only in the “Contains device” property.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Contains device	<< 49062001 Device	1..*	1..1	References Device concepts contained within the pack
Has pack size value	DEC (decimal)	0..*	0..1	Represents the quantity of the associated CDP within the package.

Has pack size unit	< 767524001_ Unit of measure	0..*	0..1	Always interpreted together with the grouped Contains packaged clinical drug attribute.
--------------------	------------------------------	------	------	---

6.4 Branded Package

The Package concept class (<211000001101) describes branded packs of devices. It is analogous to the BCDP concept for medicinal products differing only in the “Contains device” property.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has product name	< 774167006 Product name	1..1	0..0	Concept brand name.
Contains device	<< 49062001 Device	1..*	1..1	References Device concepts contained within the pack
Has pack size value	DEC (decimal)	0..*	0..1	Represents the quantity of the associated CDP within the package.
Has pack size unit	< 767524001_ Unit of measure	0..*	0..1	Always interpreted together with the grouped Contains packaged clinical drug attribute.

6.5 Containered Branded Package

The Containered branded package concept class describes a branded pack of devices, in specific packaging. It is analogous to the CBCDP concept for medicinal products differing only in the “Contains device” property.

Attribute	Allowable range	Concept Cardinality	In Group Cardinality	Details
Has product name	< 774167006 Product name	1..1	0..0	Concept brand name.
Has container type	<< 706437002 Container	1..1	0..0	The type of container the devices are supplied in.
Contains device	<< 49062001 Device	1..*	1..1	References Device concepts contained within the pack
Has pack size value	DEC (decimal)	0..*	0..1	Represents the quantity of the associated CDP within the package.
Has pack size unit	< 767524001_ Unit of measure	0..*	0..1	Always interpreted together with the grouped Contains packaged clinical drug attribute.

7 ARTG ID Reference Set

The Australian Register of Therapeutic Goods Identification (ARTG ID) reference set, is a component of the AMT. The ARTG ID is a unique identifier assigned to each entry in the Australian Register of Therapeutic Goods (ARTG). The ARTG is a database maintained by the Therapeutic Goods Administration (TGA), which is the regulatory authority responsible for the regulation of therapeutic goods, including medicines and medical devices, in Australia.

The purpose of the ARTG ID reference set within the AMT is to link medicines and other therapeutic goods to their corresponding entries in the ARTG. This linkage allows healthcare professionals, researchers, and regulatory authorities to access accurate and up-to-date information about registered therapeutic goods, including details such as their formulation, indications, dosage forms, and regulatory status.

The ARTG ID reference set is a simple map following the SNOMED CT RF2 format for reference sets, with the `referencedComponentId` being a CBCDP from AMT and the `schemeValue` being the ARTG ID. Entries are generally not inactivated unless erroneous, and maps may exist for products that are not longer registered with the TGA. A small example is shown in Table 3.

Table 3: ARTG ID Map example

Reference Metadata	referencedComponentId	schemeValue
...	Prelinaccord 25 mg capsule, 14, bottle	235836
...	Gardasil injection, 0.5 mL vial	124408
...	Vitrasert 4.5 mg implant, 1, sachet	61486
...	Rectinol HC ointment, 30 g, tube	72940

Note: `referencedComponentId` within the files are concept Identifiers, but preferred terms are shown for readability.

Appendix A Example AMT product model diagrams

Summary

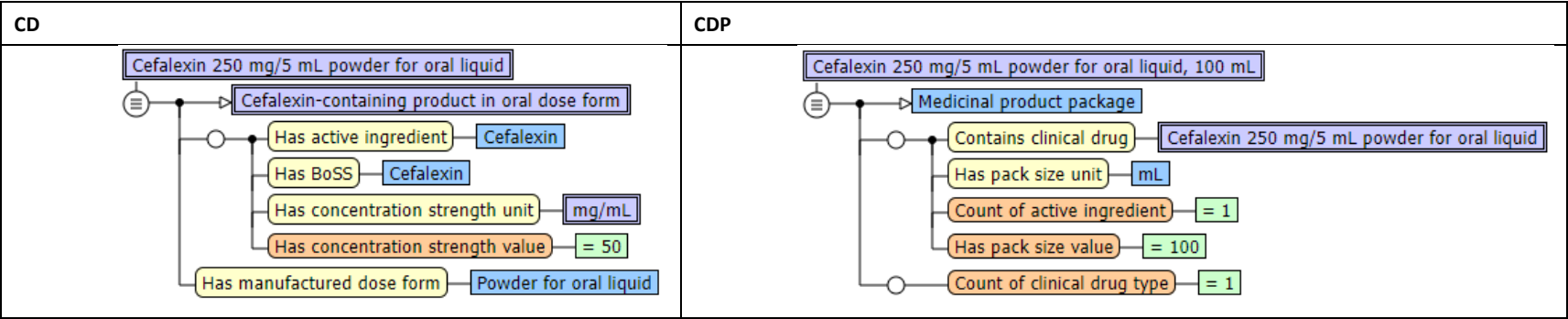
This section includes model diagrams for six AMT products. Various products have been deliberately chosen to illustrate specific parts of the AMT model and data.

The diagrams show defining relationships and represent the Distribution Normal Form (DNF), which mirrors the current release format.

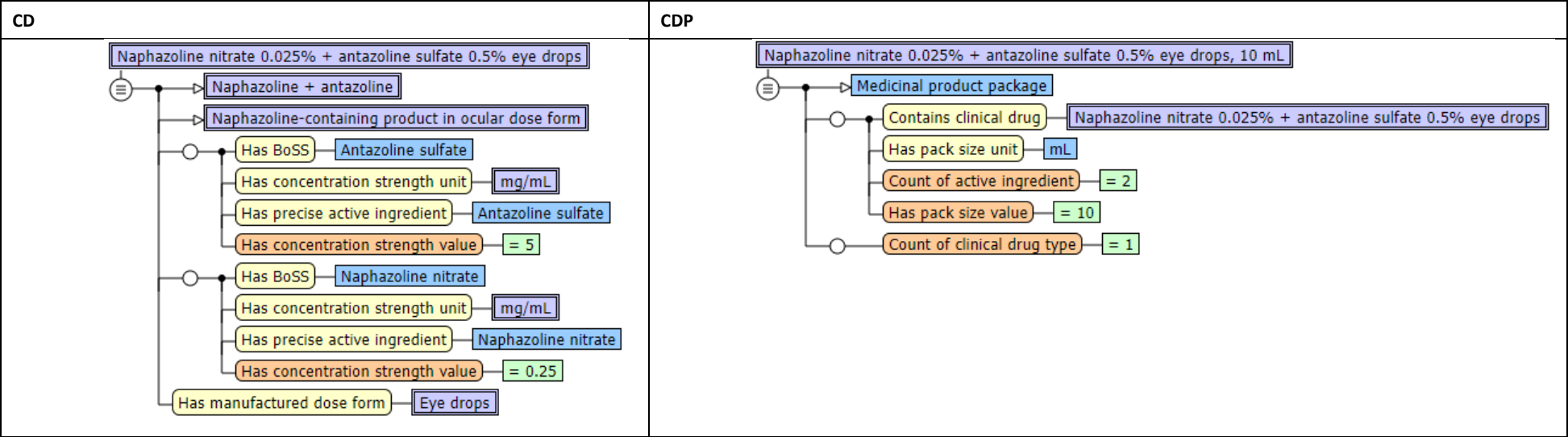
All of these diagrams and more are available through the CSIRO Shrimp terminology browser <http://ontoserver.csiro.au/shrimp/>. Note: the diagrams conform to the *SNOMED CT Diagramming Guideline* (SNOMED International, 2021).

Appendix	Product name preferred term	Concept ID	Features
A.1.1	cefalexin 250 mg/5 mL powder for oral liquid, 100 mL	28273011000036101	• CDP • Continuous dose form • Normalised strength modelling
A.1.2	naphazoline nitrate 0.025% + antazoline sulfate 0.5% eye drops, 10 mL	26636011000036101	• CDP • Multi-ingredient • Continuous dose form
A.1.3	Nicotine (Amcal) 14 mg/24 hours patch, 21, sachet	61252011000036109	• Release rate strength • Sponsor name in the description • Drug-device combination
A.1.4	Afeme Duo (1 x 150 mg capsule, 1 x 10 g cream), 1 pack	736231000168100	• Multipack product, different components • Strength in BCD for the cream is expressed as a percentage
A.1.5	Yaz (24 x 3 mg/20 microgram tablets, 4 x inert tablets), 6 x 28, blister packs	750741000168100	• Multi-ingredient tablet • Multi-component • Inert substance • Multipack product
A.1.6	Demazin PSE Cold and Flu Day and Night (16 x Day tablets, 8 x Night tablets), 24, blister pack	1092471000168105	• Multi-ingredient and multi-component • Unit conversion (<i>Strength</i> attribute) • Is modification of

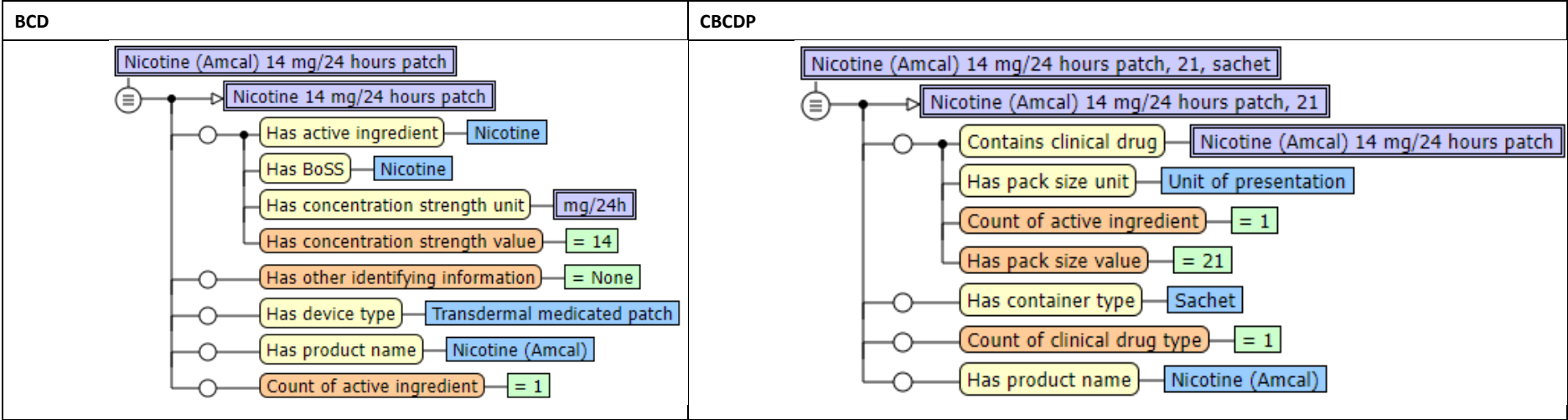
A.1.1 Cefalexin 250 mg/5 mL powder for oral liquid, 100 mL (28273011000036101)



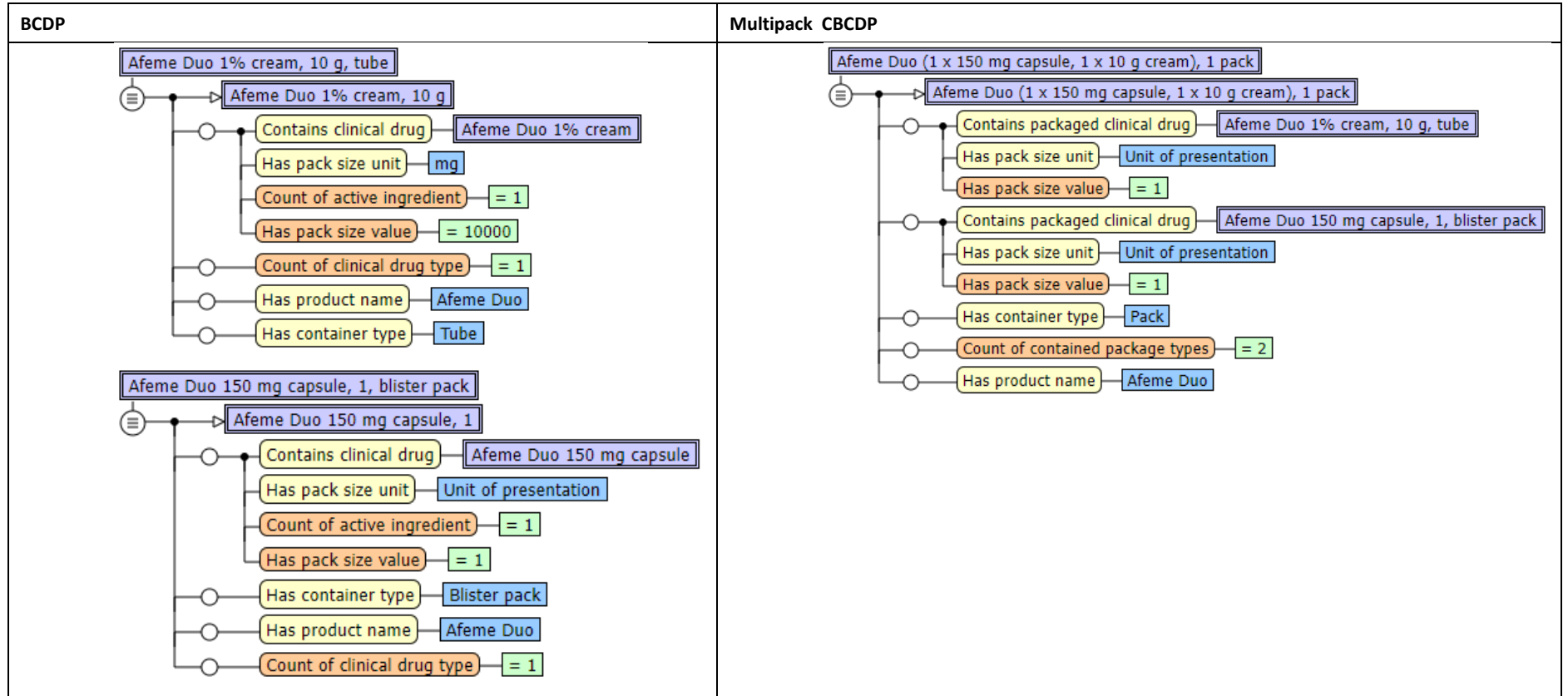
A.1.2 Naphazoline nitrate 0.025% + antazoline sulfate 0.5% eye drops, 10 mL (26636011000036101)



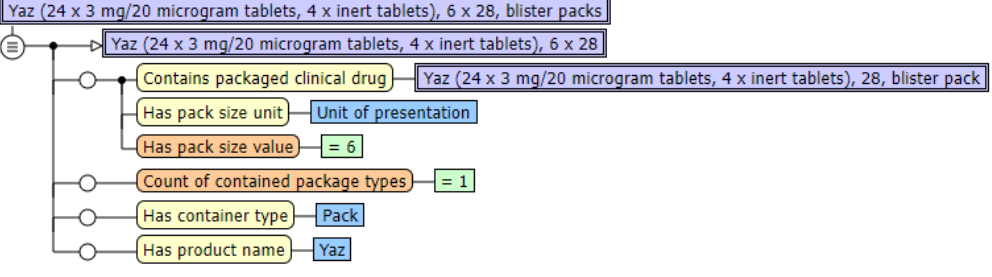
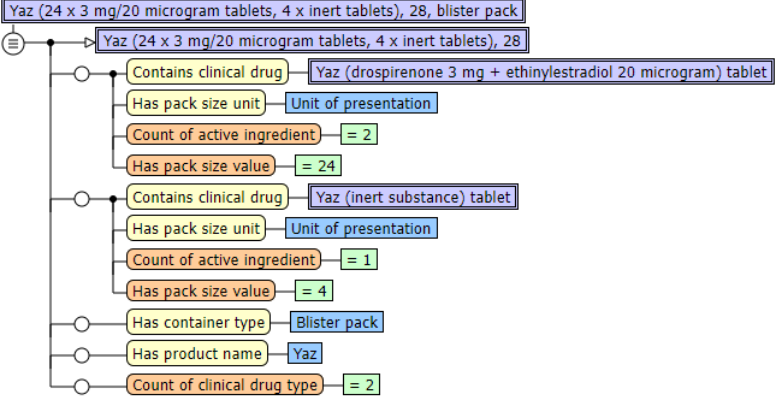
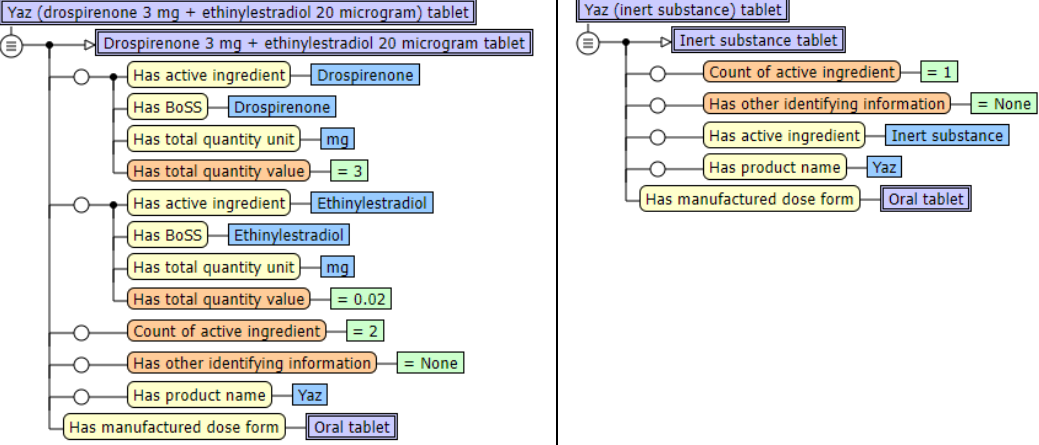
A.1.3 Nicotine (Amcal) 14 mg/24 hours patch, 21, sachet (61252011000036109)



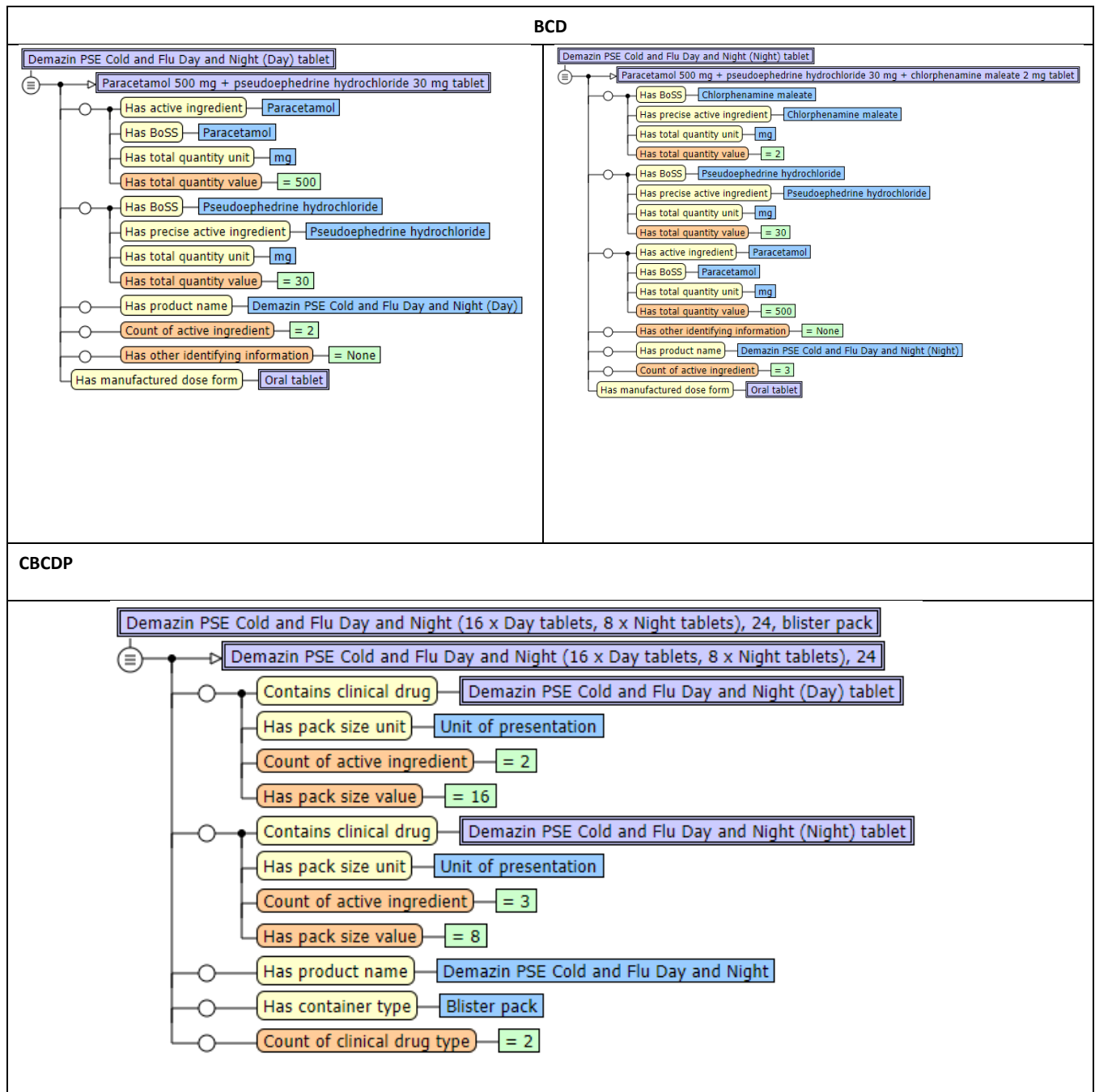
A.1.4 Afeme Duo (1 x 150 mg capsule, 1 x 10 g cream), 1 pack (736231000168100)



A.1.5 Yaz (24 x 3 mg/20 microgram tablets, 4 x inert tablets), 6 x 28, blister packs (750741000168100)

Multipack CBCDP	
Component CBCDP	
Component BCDs	

A.1.6 Demazin PSE Cold and Flu Day and Night (16 x Day tablets, 8 x Night tablets), 24, blister pack (1092471000168105)



A.2 Notable concept reference specifications

A.2.1 MP reference set

N/A

MP reference set is unable to be generated from ECL. Is determined at the time of authoring, but intermediate non-AMT concepts prohibit ECL generation.

A.2.2 MPUU reference set

```
^929360081000036101|MPP Reference set|  
.(999000081000168101|Contains Device| OR 774160008|Contains clinical drug|)
```

A.2.3 MPP reference set

```
(  
(<781405001|Medicinal product package| OR <999000071000168104|Package|)  
:[0..0] 774158006|Has product name|=*,  
[0..0] 30465011000036106|Has container type|=*  
)
```

A.2.4 TP reference set

```
<774167006|Product name (product name)|
```

A.2.5 TPUU reference set

```
(<763158003|Medicinal Product| OR <49062001|Device|)  
:774158006|Has product name|=*
```

A.2.6 TPP reference set

```
(  
  (<781405001|Medicinal product package| OR <999000071000168104|Package|)  
  :774158006|Has product name|=*,  
  [0..0] 30465011000036106|Has container type|=*  
)
```

A.2.7 CTPP reference set

```
(  
  (<781405001|Medicinal product package| OR <999000071000168104|Package|)  
  :774158006|Has product name|=*,  
  30465011000036106|Has container type|=*  
)
```


Acronyms

Acronym	Description
AMT	Australian Medicines Terminology
ARTG	Australian Register of Therapeutic Goods
AUST L	TGA listed item
AUST R	TGA registered item
BCDP	Trade Product Pack
BoSS	Basis of Strength Substance
CBCDP	Containerized Branded Clinical Drug Packaged
ETP	Electronic Transfer of Prescriptions
FSN	Fully Specified Name
GP	General Practitioner
IHTSDO	International Health Terminology Standards Development Organisation
INR	International Normalised Ratio
MP	Medicinal Product
MPP	Medicinal Product Pack
MPUU	Medicinal Product Unit of Use
NCTS	National Clinical Terminology Service
PBS	Pharmaceutical Benefits Scheme
PES	Prescription Exchange Service
PN	Product Name
PT	Preferred Term
RPBS	Repatriation Pharmaceutical Benefits Scheme

Acronym	Description
SNOMED CT	Systematized Nomenclature of Medicine, Clinical Terms; also refers to the International edition of SNOMED CT
SNOMED CT-AU	SNOMED CT, Australian Edition
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
TGA	Therapeutic Goods Administration
TPUU	Trade Product Unit of Use

References

- Australian Digital Health Agency. (2016). *SNOMED CT-AU Guide for Terminology Use in Prescribing v1.0*. Retrieved August 2023, from https://www.healthterminologies.gov.au/library/DH_2399_2016_SNOMEDCTAU_GuideforTerminologyUseinPrescribing_v1.0.pdf?_filename=DH_2399_2016_SNOMEDCTAU_GuideforTerminologyUseinPrescribing_v1.0.pdf
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- SNOMED International. (2021). *SNOMED CT Diagramming Guideline*. Retrieved from <http://snomed.org/diagram>
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