nehta

AMT v3 Overview and Detailed Business Use Cases

Australian Medicines Terminology

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Approved for Release

National E-Health Transition Authority

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Document information

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Approvals

This document has been approved on the basis that the appropriate input has been obtained during its development.

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Quality reviews

Revision	Version	Reviewer(s)	Type of review	Purpose
	002	Subject matter experts	Peer	Ensure the adequacy of the scope, content and structure.
	003	Technical writer	Editorial	Ensure the clarity and editorial conformance of the finalised document.

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1 Introduction

1.1 Purpose

The purpose of this document is to provide stakeholders with a general, high level overview of the Australian Medicines Terminology version 3 (AMT v3) model, as well as provide details of the core business use cases that v3 is designed to support as part of clinical processes within the context of healthcare provision.

The document aims to provide an understanding of what the AMT v3 product is, why it exists, how the components can be used to achieve certain use cases and the scope and limitations with regards to content and product. This is a non-technical document, designed to enable a person to understand and assess the suitability of the AMT v3 for their needs. It is not intended to be used for implementing the AMT v3: please see the *AMT v3 Technical Implementation Guide* [1] for such purposes.

1.2 Intended audience

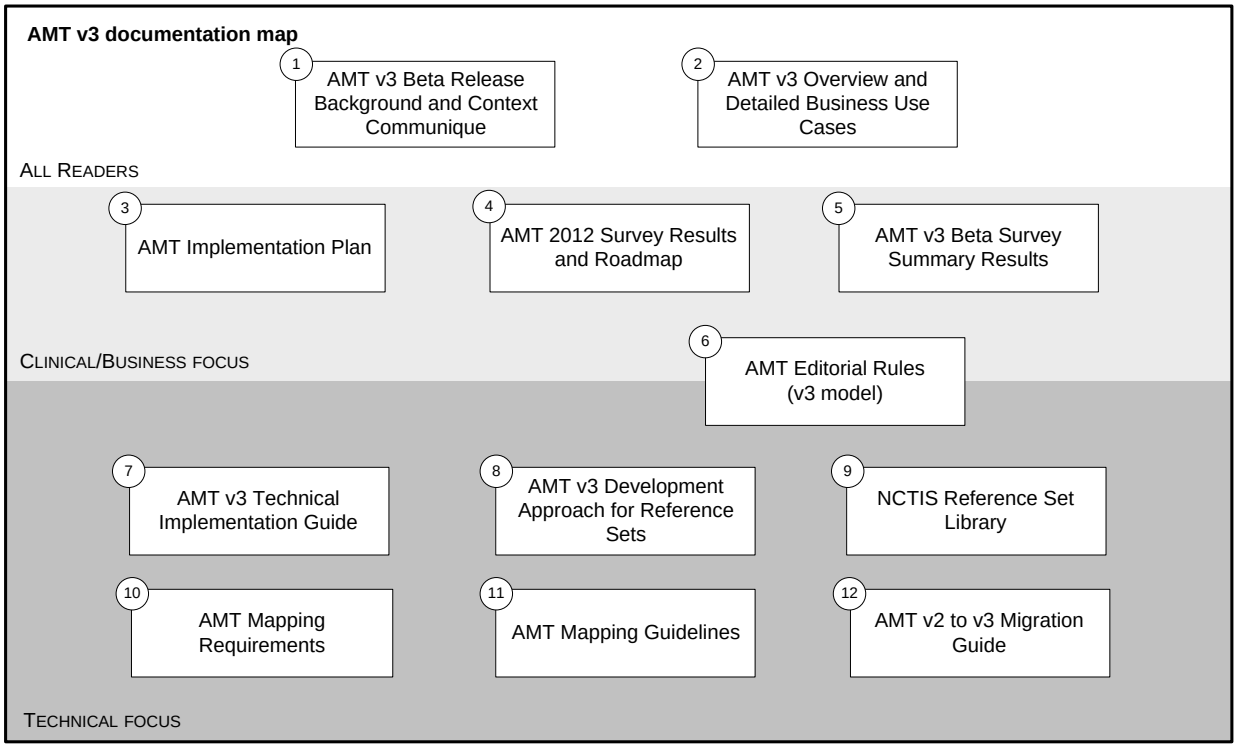
This document should be read by anyone with a practical interest in the AMT v3. This very broad readership is categorised as follows for the purposes of the AMT v3 documentation suite.

Business: Business owners, product managers, project managers, policy makers.

Clinical: Healthcare professionals and other end users.

Technical: Programmers, content developers, testers, information system suppliers, analysts, terminology/classification specialists, health IT professionals and researchers.

1.2.1 Documentation map



Recommended reading lists for the different types of readers are as follows. Items with asterisks need only be read if relevant to the reader's needs.

Doc No.	Doc Name	Business	Clinical	Technical
1	*AMT v3 Beta Release Background and Context Communique*	Y	Y	Y
2	*AMT v3 Overview and Detailed Business Use Cases*	Y	Y	Y
3	*AMT Implementation Plan*	Y	Y	
4	*AMT 2012 Survey Results and Roadmap*	Y	Y	Y
5	*AMT v3 Beta Survey Summary Results*	Y	Y	Y
6	*AMT Editorial Rules (v3 model)*		Y*	Y*
7	*AMT v3 Technical Implementation Guide*			Y
8	*AMT v3 Development Approach for Reference Sets*			Y*
9	*NCTIS Reference Set Library*			Y*
10	*AMT Mapping Requirements*			Y*
11	*AMT Mapping Guidelines*			Y*
12	*AMT v2 to v3 Migration Guide*			Y*

The prerequisites for each document are described in their respective introductions. However, the document numbers cited here give a rough indication as to the recommended sequence of reading.

1.3 Scope

1.3.1 In scope

A brief introduction and overview of the AMT v3 will be provided on the following for non-technical users:

- The AMT in context, including the need for the AMT, its use in clinical systems, implementation methods, plus licencing and obligations. The use cases in this document (see Section 4) initially focus on the following clinical scenarios:
  - Prescriber, (pack-based prescribing)
  - Dispenser, (pack-based dispensing)
- Transfer of Information between prescriber and dispenser

The AMT v3 model supports additional use cases, which will be covered in future iterations of this document.

1.3.2 Out of scope

This document currently has a reduced use case scope, as defined in the previous section. Additional use cases currently considered to be out of scope for this version of the document include:

- Prescribing – (non-pack-based)
- Recording
- Review
- Issue – including dispensing, (non-pack-based)
- Administer
- Transfer of information – with the exception of transfer of information between prescriber and dispenser
- Other use cases in the *AMT implementation plan* [2] not otherwise mentioned in this document.

This document does not provide detailed technical guidance and excludes the technical specifications for the AMT v3. These technical guidelines can be found in the *AMT v3 Technical Implementation Guide* [1].

Broader information about the AMT, and plans for future development can be found in NEHTA's *AMT implementation plan* [2] and the *AMT roadmap* [3].

1.4 Background

The AMT v3 has been developed by NEHTA's National Clinical Terminology and Information Service (NCTIS) in response to a 2009 stakeholder review of the AMT model. The revised AMT model is intended to simplify implementation and content authoring and to ease maintenance. An additional benefit of the revised model is that it will facilitate future efforts to integrate the AMT with SNOMED CT-AU[1].

For more information, see *AMT v3 Beta Release Communique* [4].

1.4.1 NEHTA

The National E-Health Transition Authority Limited (NEHTA) is a not-for-profit company established by the Australian Federal, State and Territory governments to develop better ways of electronically collecting and securely exchanging health information.

Electronic health information systems that are interoperable are essential for delivering high quality care across the health sector. By enabling the exchange of clinical and administrative information across the health sector, these systems have the potential to unlock substantially greater quality, safety and efficiency benefits.

Improved management of medication information is seen as one of the key areas for urgent reform. Benefits are particularly clear for medication management, where inconsistent or incomplete information not only results in inefficiency and unnecessary expense, but can also have an adverse impact on clinical care.

For more information about NEHTA, please visit the official website: http://www.nehta.gov.au/.

[1] IHTSDO®, SNOMED® and SNOMED CT® are registered trademarks of the International Health Terminology Standards Development Organisation.

1.4.2 NCTIS

The National Clinical Terminology and Information Service (NCTIS) was established by NEHTA to function as Australia's national terminology release centre. See *Clinical Terminology and Information* [5] for more information.

1.4.3 The AMT

The Australian Medicines Terminology (AMT) is the intended national standard coding system for selecting, recording and communicating categorical descriptive medicines information within and between Australian eHealth applications. As part of the transition to electronic health systems, the need for an accessible standard terminology to uniquely identify and describe the medicines available in Australia for computers, clinicians and patients is essential. The AMT has been created to provide:

- a standard code for identifying branded and generic medicines; and
- standard naming conventions to accurately describe medicines.

Further information about the AMT can be found at the NCTIS website[2] as well as *AMT v3 Editorial Rules* [6].

1.5 AMT licences and obligations

1.5.1 Licence agreements

The AMT data are only available via the NCTIS website (https://nehta.org.au/aht) and require a licence to use, as the files contain SNOMED CT identifiers.

All parties who download and use the AMT are required to agree to the *SNOMED CT Affiliate Licence Agreement* [7] and the *Australian National Terminology Release Licence Agreement* [8]. When a software developer integrates the AMT into their products, whether it is a proprietary terminology product or a proprietary software product, the developer needs to comply with all licensee obligations.

NEHTA provides the Australian Medicines Terminology at no cost to holders of the above licences.

Note: The AMT v3, unlike the AMT v2, does not have a viewer.

1.5.2 Obligations

All licencing information and FAQs are available on the NCTIS website (https://nehta.org.au/aht)[3].

All users must comply with all sections, terms and conditions in the licence agreements, with particular reference to the following:

- All obligations set out in the licence agreement: see Section 9. Licensee obligations and Section 10. Additional Licensee Obligations of the Australian_National_Terminology_Release_Licence_agreement_200910.
- New versions and changes to licence terms: see Section 6: Australian_National_Terminology_Release_Licence_agreement_200910.

[2] https://nehta.org.au/aht/index.php?option=com_content&task=view&id=40&Itemid=69.
[3] FAQs are available at https://nehta.org.au/aht/index.php?option=com_content&task=section&id=3&Itemid=69.

1.6 Feedback and further information

The NCTIS places a high value on any feedback about the usefulness of this document and encourages comments and suggestions to be sent to terminologies@nehta.gov.au. Additional contact details are provided in the 'Document Information' section on p. 3 of this document.

2 The AMT in context

2.1 Statement of purpose

The AMT delivers standardised identification of brand (trade) products and equivalent generic medicines along with associated components that are supported through standard naming conventions that accurately describe medications.

The AMT has been developed to be fit for the purpose of unambiguously identifying for clinicians and computer systems commonly used medicines[4] in Australia and can be implemented in clinical information systems for the following activities:

- Prescribe
- Record
- Review
- Issue – including dispense
- Administer
- Transfer of information

2.2 Overview of the AMT

The AMT uniquely and unambiguously codes and describes medicines, using a set of defining properties, and is intended to cover all commonly used medicines in Australia.

The key aim of the AMT is to provide a consistent and safe approach to the identification and naming of medicines, which can support medicines management and activity across the entire Australian health domain. The medicines terminology continues to be developed and made available for use in medication management in Australia.

The following objectives of the AMT are of primary importance:

- Consistent identification of branded and generically equivalent medicines.
- Consistent naming conventions and terminology used to describe and search for medications.

The AMT has been updated, in both content and structure, to version 3 and the data files are located in the NCTIS site (https://nehta.org.au/aht/).

Broader overview information about the AMT can be found in the *AMT v3 Editorial Rules* [6].

2.3 What is the AMT?

The AMT model provides standard codes and descriptions for generic (‘medicinal’) and branded (‘trade’) products, at a number of levels of detail – from a generic ‘medicinal product’, e.g. amoxycillin, to a branded ‘Containered Trade Product Pack (CTPP)’, e.g. Amoxil 500 mg capsule:hard, 20 capsules, blister pack, which contains the same generic ingredient.

The AMT model, with a representative example, is shown in the figure below.

[4] Currently this includes items from the Pharmaceutical Benefits Scheme (PBS), Repatriation Pharmaceutical Benefits Scheme (RPBS), and a range of items from the Therapeutic Goods Administration (TGA), TGA registered items (AUST R) and TGA listed items (AUST L) in Australia.

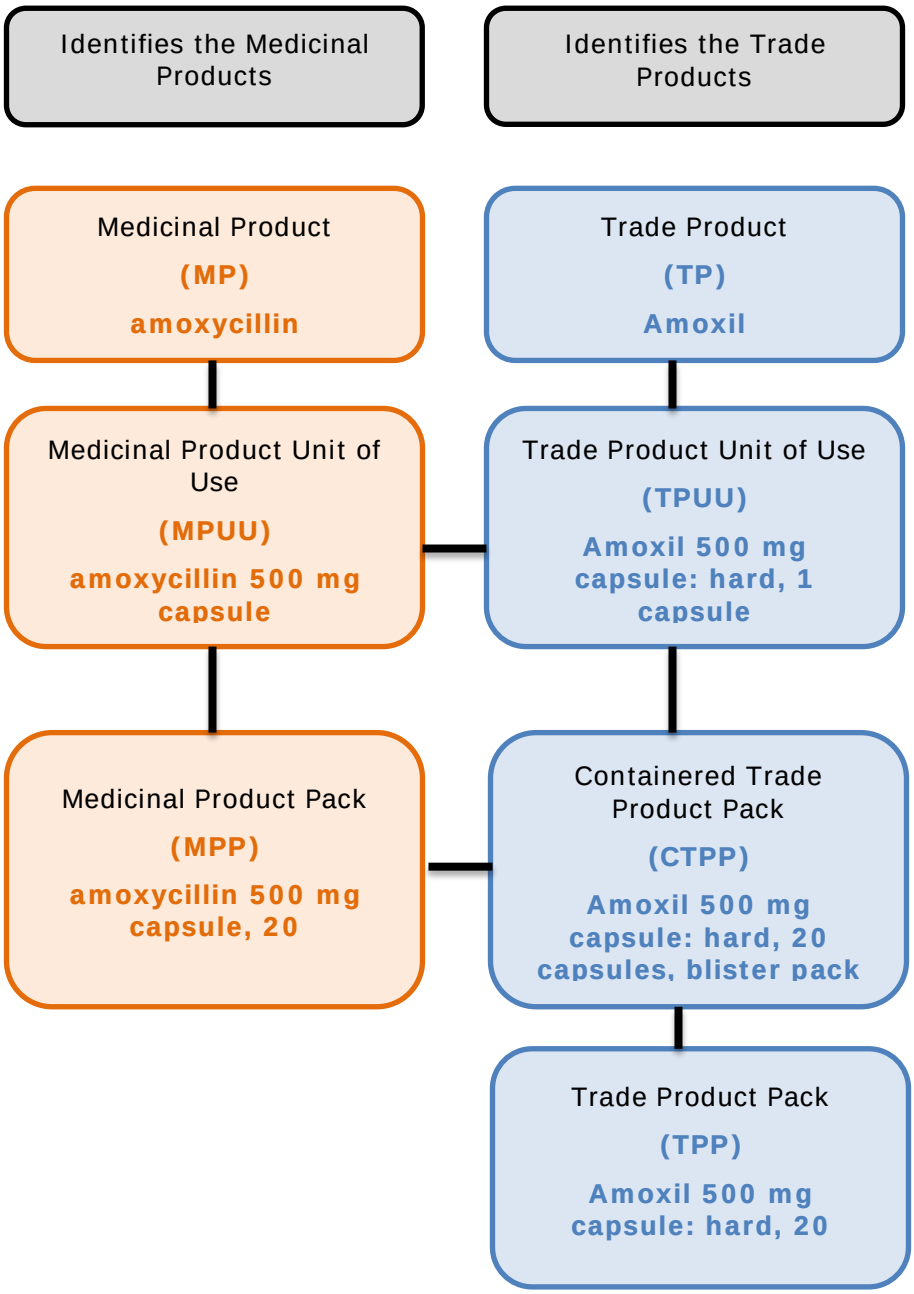


Figure 1: Medicinal and Trade products

As a terminology, the AMT is primarily designed to enable interoperability between applications and computers by providing a set of codes and descriptions for use across Australia. It also contains information about the relationships between products, base and salt substance data, as well as information to enable the computation of product strengths.

The AMT is not a substitute for the additional data and knowledge required to fully support electronic prescribing or dispensing. Examples of knowledge areas within the medicines domain that are not included in the AMT include PBS pricing, PBS and general product availability, poisons schedule, adverse effects, dose checking, indications, contraindications, drug-drug interactions and cautionary advice.

The inclusion of any concept within the AMT does not mean that the concept is automatically suitable for use in electronic prescribing without further consideration of its suitability in any given context. For example, the medicinal representations of multi-ingredient products are included for structural completeness of the terminology, but should not be presented to clinicians as potentially prescribable items; the corresponding trade descriptions should be used instead.

Please note that these distinctions, and others like them, cannot be made solely by using the AMT. Implementers should match use case requirements to the AMT content to ascertain its suitability within a particular clinical domain.

2.4 Benefits of the AMT

Interoperable electronic health information is essential for delivering high quality care across the Australian health sector. By enabling the exchange of clinical and administrative information, these electronic processes have the potential to deliver greater quality, safety and efficiency of care. Interoperable electronic health information aids in the sharing and exchange of clinical information about medicines, such as in eMedications management, eDischarge summaries, eReferrals and Personally Controlled Electronic Health Records (PCEHRs).

The AMT is designed and developed using guidelines that have been subject to iterative external review and subsequent modification to reflect current clinical and safety advice. It is primarily intended for use in clinical software applications to facilitate interoperability between systems, but can also be utilised and consumed by knowledge resource developers, clinicians, researchers, statistical users, government agencies, healthcare organisations and consumers.

2.5 Using the AMT in clinical systems

One of the enablers of interoperability in medicines management is a standard medicines terminology, which uniquely identifies and describes medicines for use in computer systems by clinicians and by consumers. This allows information about medicines to be transferred electronically without misunderstanding or loss of meaning.

At present, there are numerous medicines description files in use across Australia, which have broadly similar essential data, but are designed in slightly different formats and perform slightly different functions. These include: the Australian Register of Therapeutic Goods (ARTG) as maintained by the Therapeutic Goods Administration (TGA); the Pharmaceutical Benefits Scheme (PBS) Schedule; and state-wide and local hospital drug formularies and proprietary drug files, such as those used by the medical software and knowledge resource industry.

In response to this situation, and to further the goal of interoperability of electronic health clinical information, NEHTA produced the AMT, as the standard medicines terminology for Australia.

NEHTA specifications for eHealth messages require the use of the AMT to describe medicines, in the following:

- Electronic Prescription
- Prescription Request
- Dispense Record
- Referral
- Specialist Letter
- Discharge Summary
- Shared Health Summary

The AMT is consequently one of the key foundations for the Personally Controlled Electronic Health Record (PCEHR), see *PCEHR concept of operations* [9] and *e-Communications in Practice* [10].

The AMT may also be used for purposes other than eHealth messaging and system interoperability, for example within clinical systems delivering various aspects of electronic medications management. These purposes are beyond the intended scope of this document, but include:

- Prescribing;
- Recording information about medicines (for example within an electronic patient record);
- Reviewing a consumer's medicines;
- Issuing medicines to a patient (including dispensing); and
- Administering medicines to a patient.

The AMT supports multiple clinical processes and provides a foundation for other NEHTA initiatives. Figure 2 below illustrates the context of these initiatives from the AMT perspective in a UML-like diagram and includes:

- The AMT high-level use cases with actors, associations and dependencies.
- The Prescribe and Dispense business context along with the use cases, associated actors and logical flow of transfer of paper and electronic prescriptions, dispense records plus claim records.
- The logical flow and transfer of clinical information containing medicines terminology from the users of the AMT who are participating in the PCEHR and the prescription and dispense record repository adaptor to the PCEHR repositories.

To illustrate the link and common usage of the AMT between these different contexts, actors are linked across the different contexts using UML generalisation and specialisation notation. More information on the use of the AMT is provided in the text boxes in the diagram.

Full details of the PCEHR and the process of electronic transfer of prescriptions (ETP) and dispense records are available in the *PCEHR concept of operations* [9] and *e-Communications in Practice* [10] and their referenced documents.

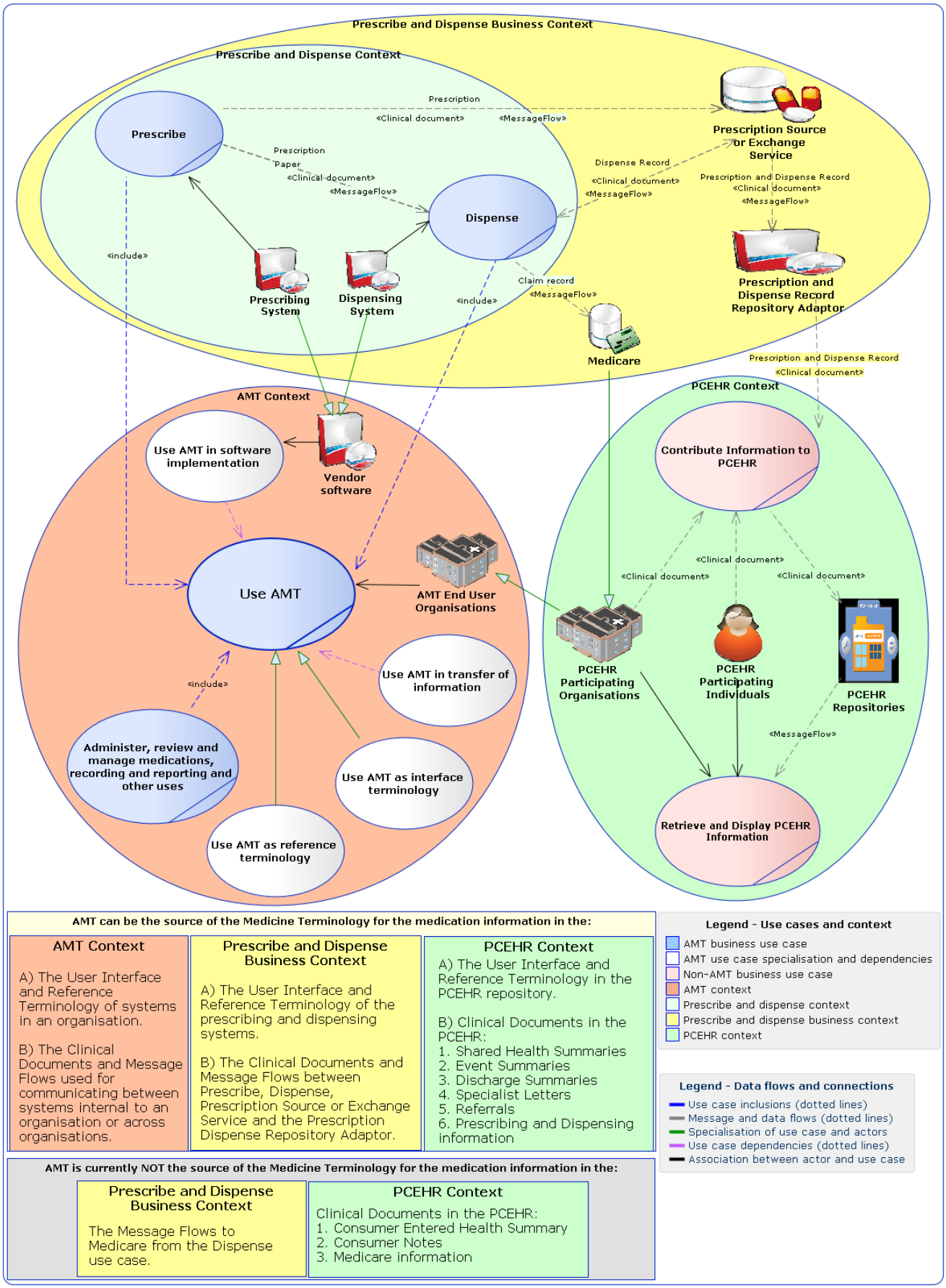


Figure 2: AMT High level use case context and logical data flow diagram

The table below summarises the main components within the AMT and their typical relevance to these uses.

Table 1: Uses of AMT components

AMT concept group	Prescribing	Record	Review	Issue (including dispense)	Administer
Medicinal Product (MP)		✓	✓		
Medicinal Product Pack (MPP)	✓	✓	✓		
Medicinal Product Unit of Use (MPUU)	✓	✓	✓		
Trade Product (TP)		✓	✓		
Trade Product Pack (TPP)	✓	✓	✓	✓	
Trade Product Unit of Use (TPUU)	✓	✓	✓	✓	✓
Containered Trade Product (CTPP)	✓	✓	✓	✓	
Substance		✓	✓		

Users intending to use the AMT for secondary purposes such as research and statistical reporting should contact the NCTIS[5] for specific implementation guidance.

2.6 Implementation methods

Healthcare providers and vendors may implement the AMT in their clinical information systems in multiple ways, dependent upon business need. There are three broad options of increasing maturity for the implementation of the AMT:

- **Map the AMT to an existing local medicines list.**
- **Replace the current local medicines list with a Commercial off the Shelf (COTS) medicines dictionary product that has been mapped to the AMT.**
- **Implement the AMT natively.**

These options are illustrated below:

[5] terminologies@nehta.gov.au

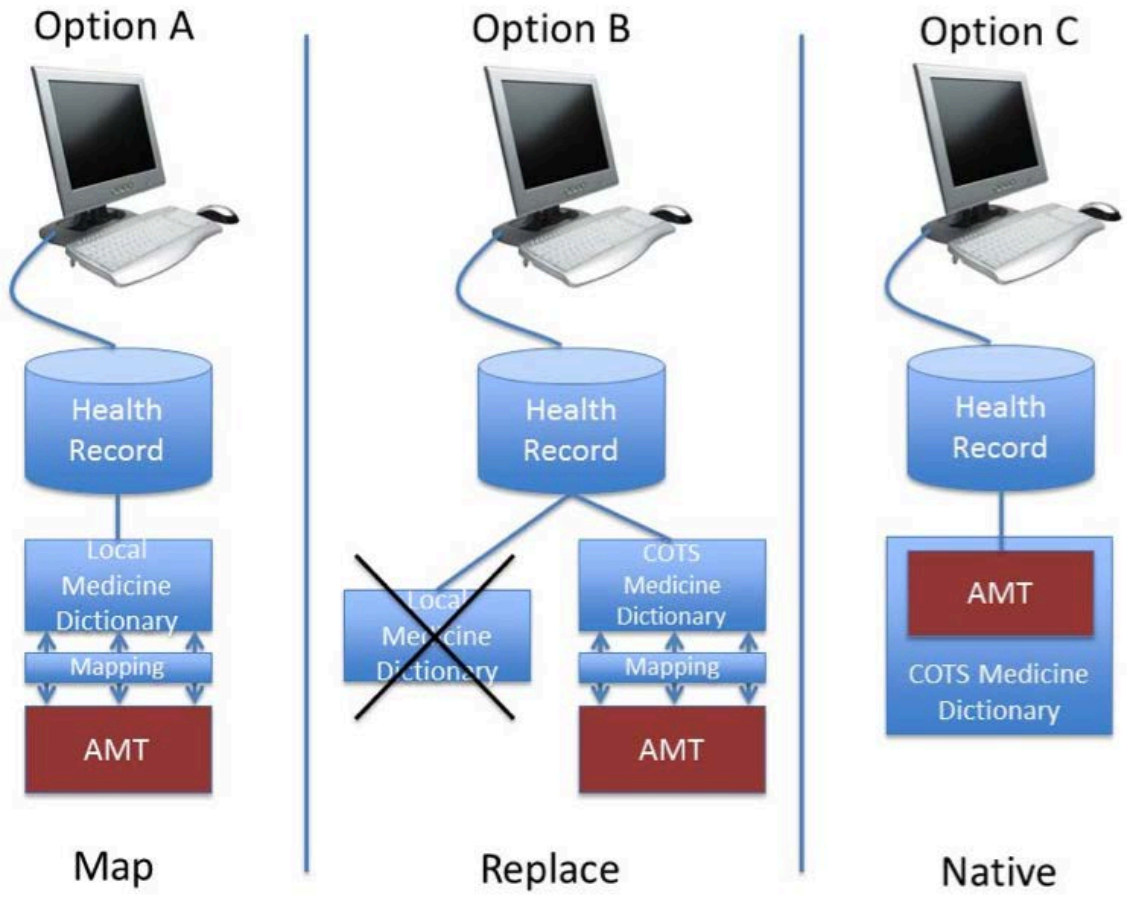


Figure 3: Implementation methods

For further information on implementation, refer to *the AMT v3 Technical Implementation Guide* [1] and the *AMT implementation plan* [2].

3 AMT structure and components

3.1 The AMT v3

The AMT v3 model is described in detail in the *AMT v3 Technical Implementation Guide* [1]. Please reference this document for further information on the following sections.

3.1.1 Notable concept classes and attributes

A 'concept' is a clinical meaning identified by a unique numeric identifier (conceptId) that never changes. Each concept is represented by a unique human-readable Fully Specified Name (FSN). The concepts are formally defined in terms of their relationships with other concepts. These 'logical definitions' give explicit meaning which a computer can process and query on. Every concept also has a set of descriptions that name the concept in a human-readable way.

The AMT includes concept hierarchies of Australian product, Australian substance and Australian qualifier, where concepts are arranged in a tree-like fashion, and parent concepts subsume child concepts.

Refer to Figure 5: AMT v3 model UML representation

3.1.1.1 Product concepts and attributes

Australian product

There are seven distinct 'Product' concepts, known as the 'AMT notable product classes'

- Medicinal Product (MP);
- Medicinal Product Unit of Use (MPUU);
- Medicinal Product Pack (MPP);
- Trade Product (TP);
- Trade Product Unit of Use (TPUU);
- Containered Trade Product Pack (CTPP); and
- Trade Product Pack (TPP).

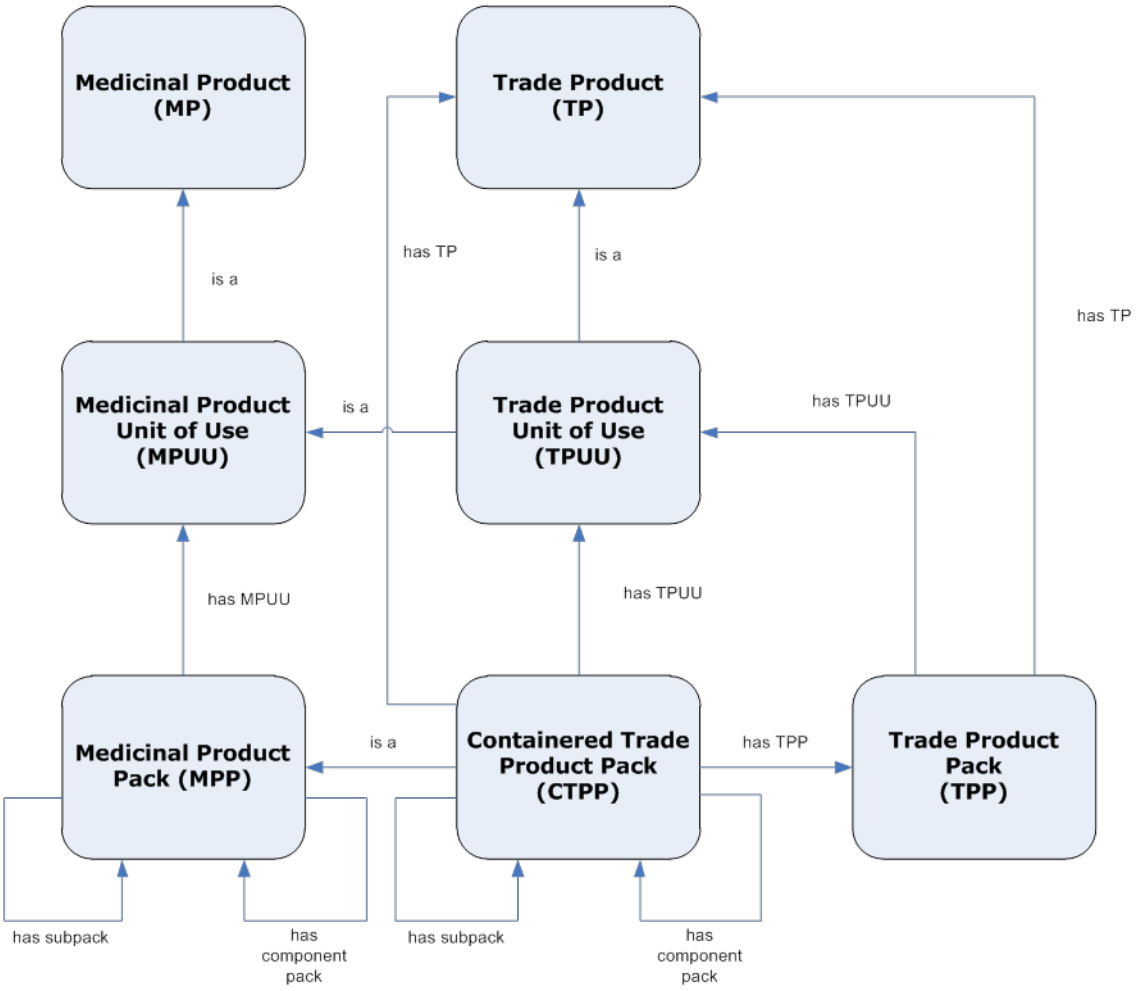


Figure 4: The AMT v3 model (Product Concepts)

3.1.2 Additional concept classes and attributes

The remaining concepts within the AMT fall within the substance and qualifier concepts and are as follows:

3.1.2.1 Australian substance concepts

These concepts represent the active ingredients within products, for example:

- Substances
- Basis of Strength Substance (BoSS)
- Inert substances

3.1.2.2 Australian qualifier concepts

These concepts will be used in the AMT to provide atomic data used to construct the name of the product and to provide additional information about an AMT product concept.

These concepts include:

- Form
- Unit of Use
- Unit of Measure
- Container Type

Additional details about the both of these concepts are also provided in Section 6 of the *AMT v3 Editorial Rules* [6].

3.1.3 Supplied reference sets

Further detailed information on reference sets may be found in the *NCTIS reference set library* [11] and the *AMT v3 refset development approach* [12], which provides information about the concrete domain reference sets.

3.1.3.1 Attribute value reference set

The *Attribute Value reference set* provides a simple mechanism to identify and implement AMT components of each of the seven notable classes:

- **Medicinal product reference set**
- **Medicinal product unit of use reference set**
- **Medicinal product pack reference set**
- **Trade product reference set**
- **Trade product unit of use reference set**
- **Trade product pack reference set**
- **Contained trade product pack reference set**

3.1.3.2 Concrete domain reference set

These files provide additional information about AMT components that cannot be described in the core SNOMED CT concept model, typically numerical information such as strength or concentration values, or pack sizes.

There are four AMT concrete domain reference set files:

- **Strength reference set** – this reference set provides information about the strength or concentration of a medicinal product, in a standardised machine-computable form.
- **Unit of use size reference set** – this reference set is used to describe the size of a unit of use, e.g. a vial of liquid in millilitres (mL).
- **Unit of use quantity reference set** – this reference set provides the number of 'unit of use' items (e.g. capsules) within a pack.
- **Sub pack quantity reference set** – this reference set provides the quantity of sub-packs contained within the parent pack.

3.1.3.3 Language reference set (Australian English language reference set)

This reference set specifies the acceptability criteria of descriptions specified for a particular language.

3.1.4 AMT v3 model UML representation

This diagram is included in this document as basic reference: more detailed information is available in the *AMT v3 Technical Implementation Guide* [1]. The diagram below is a UML representation of the AMT v3 model, specifying the key or 'notable' components and the relationships between them.

The different types of entities in this diagram are represented as follows:

- A blue box denotes a concept of an AMT notable class.
- A red box denotes an AMT reference set member.
- A grey box denotes an AMT concept not from the notable classes.

Although the AMT model is typically drawn with the most abstract concepts at the top, it is most easily understood by reading in the opposite direction to the typical reading order, that is: from the bottom right hand corner upwards and to the left.

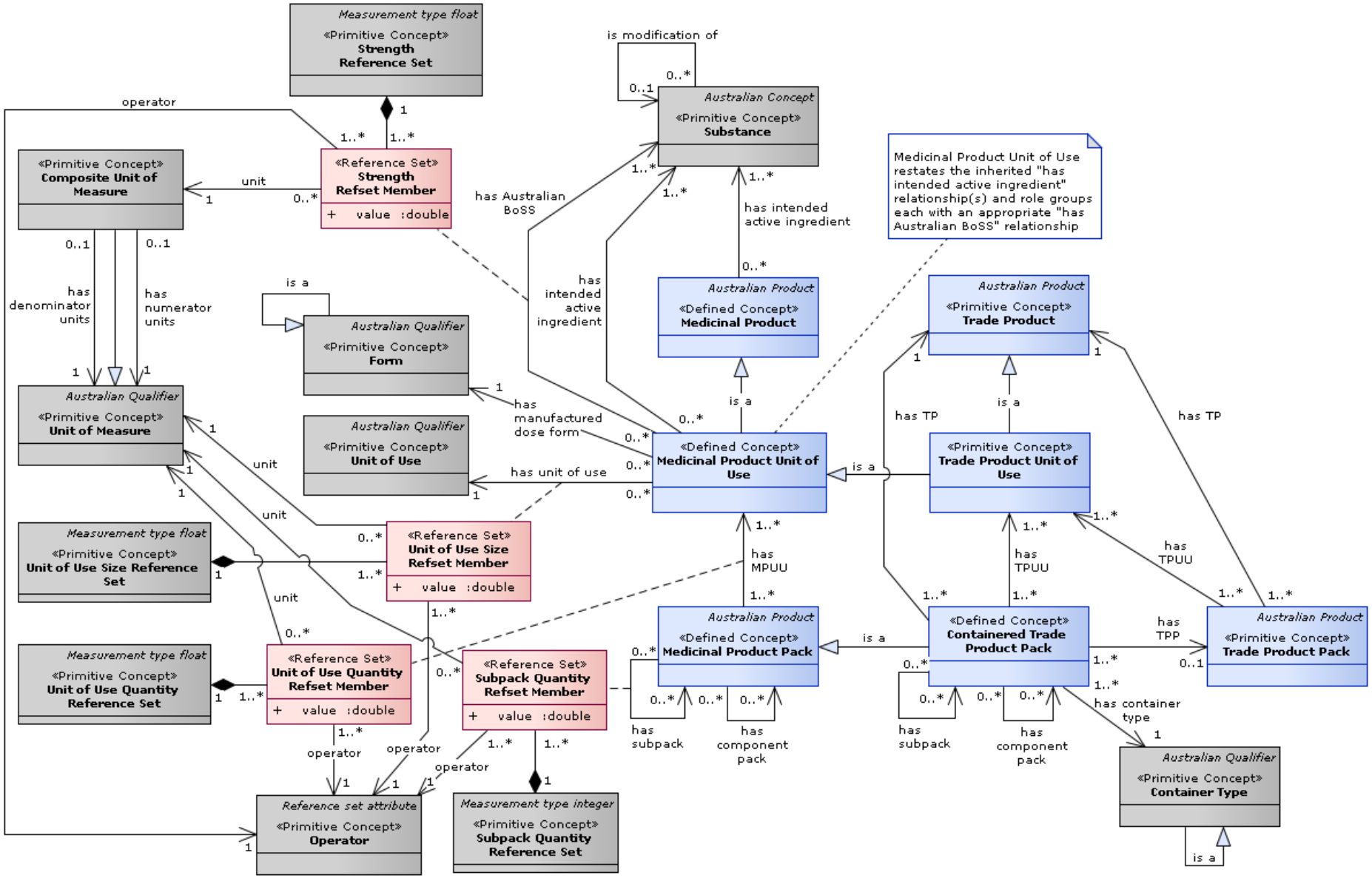


Figure 5: AMT v3 model UML representation

The following sections contain brief summary descriptions of the core or 'notable' components of the AMT.

3.1.5 Trade concepts

In the AMT, items within the Trade group are those concepts that relate most closely to the actual manufactured and labelled medicinal products packaged and supplied for direct patient use. They will begin with a brand name or a generic name with a specified manufacturer/supplier.

3.1.5.1 Trade Product (TP)

TP represents the product brand name for either single component products, or components of multi-component products, regardless of ingredients. The TP may also include any additional detail necessary for identification. For example: strength representation for multi-ingredient products (where this is necessary for differentiation); proprietary form, delivery device or container; an alternate name which has market recognisability.

3.1.5.2 Trade Product Unit of Use (TPUU)

TPUU represents a marketable formulation containing active ingredient, strength and form, in a single dose form, or a unit of use component of a multi-component pack.

3.1.5.3 Containered Trade Product Pack (CTPP)

CTPP represents the marketable medicinal entity available for patient use, with details of the container type. Its attributes include the brand, active ingredient(s), strength(s), form, unit of use quantity and container type.

A single CTPP provides additional data about a single TPP, which may be useful in some scenarios.

Certain CTPP concepts represent a sub pack, i.e. they form part of a sequential multi-component item (currently oral contraceptives and some hormone replacement therapy products).

3.1.5.4 Trade Product Pack (TPP)

TPP represents the marketable medicinal entity available for patient use, devoid of container type. Its attributes include the brand, active ingredient(s), strength(s), form and unit of use quantity.

3.1.6 Medicinal concepts

Items within the Medicinal grouping are abstract or generic summaries of a set (one or more) of equivalent Trade concepts at the same level in the AMT model. Additional information that is common to all items in a set is typically provided on the Medicinal side of the AMT model, for example active ingredients, strengths, unit of use sizes, and so on.

3.1.6.1 Medicinal Product (MP)

MP represents the abstract formulated representation of the therapeutic active ingredients that are used in the treatment of human patients in Australia.

A medicinal product concept is distinct in definition from a substance, in that it is an abstract generalisation of a medicinal product unit of use where the form and strength are not stated. As an example the medicinal product 'amoxycillin' represents an abstraction of the MPUU concepts 'amoxycilllin 250 mg capsules' or 'amoxycilllin 250 mg capsules ', rather than 'amoxycillin' the substance or ingredient.

3.1.6.2 Medicinal Product Unit of Use (MPUU)

MPUU represents the abstract formulation containing active ingredient, strength and form in a single dose form or a unit of use component of a multi-component formulation, devoid of brand. It is the generic representation of a set of one or more equivalent Trade Product Units of Use.

3.1.6.3 Medicinal Product Pack (MPP)

MPP represents the abstract concept of a marketable medicinal entity, available for patient use, devoid of brand and container type. It is the generic summary of a set of one or more equivalent Containered Trade Product Packs. It will contain the corresponding generic information about sub packs and component packs to the CTPPs to which it is linked.

3.1.7 Relationships

The AMT uses SNOMED CT defining relationships to link concepts with other concepts within the AMT.

The relationships between AMT components are vital to implementing the AMT data correctly. They provide information about the position of an AMT concept within the AMT model, and are one of the means by which additional data is associated with the core concepts, particularly when used in conjunction with reference sets.

The main types of relationships are as follows:

- IS A – These relationships provide parent-child or super type-sub type relationships and are the basis of the AMT's hierarchies.
- Other relationships – Provide a series of defining statements about each concept.

4 Core use cases involving the AMT

4.1 Medication management cycle

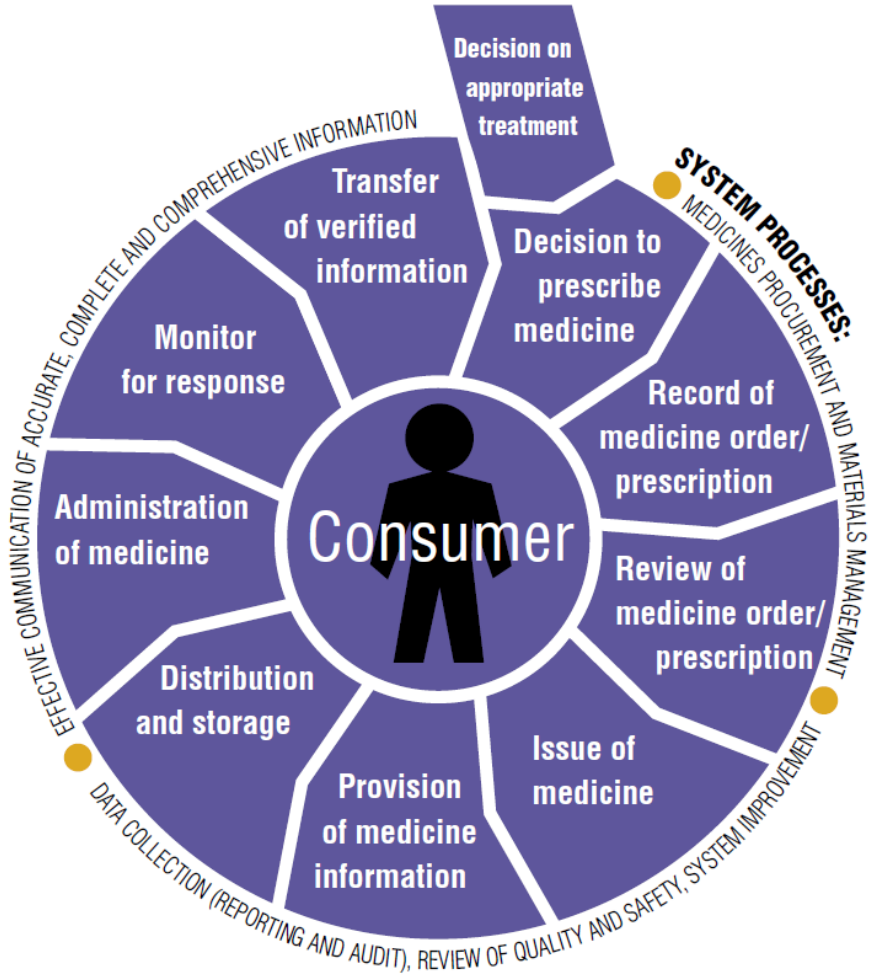


Figure 6: Medication Management Cycle[6]

Note: Click in the table below to follow the links to areas of interest within the clinical scenarios in the appendices. (Alt + left arrow will return to this page.)

Table 2: Medication management cycle in reference to AMT v3 use cases:

Processes	Appendix and page no.
Decision on appropriate treatment	A.2, p.40
	B.2, p.55
	C.2, p.63
	D.2, p.68

[6] This image is sourced from: *Guiding principles to achieve continuity in medication management* [15], p. 11.

Processes	Appendix and page no.
Decision to prescribe medicines	A.2, p.40
	B.2, p.55
	C.2, p.63
	D.2, p.68
Review of medicines order prescription	A.1.2, p.40
	B.1.2, p.55
	C.1.2, p.62
	D.1.2, p.68
Issue of medicines	A.3, p.43
	B.3, p.57
	C.3, p.64
	D.3, p.70

4.2 Core use cases

The use cases included in this document are limited to the Prescribe and Dispense. The other use cases for the AMT are not in scope for this version of the document and will be addressed in a future version.

The scope of the participants in the Prescribe and Dispense use cases are constrained to an authorised prescriber (any person authorised to prescribe) and a dispenser, (any person authorised to dispense) using pack-based prescribing and dispensing.

4.3 Generic Prescribe and Dispense use case

Figure 7 below is a generic depiction of the Prescribe and Dispense process to put the use of the AMT in context and illustrate the interactions between the Prescribe and Dispense use cases. Messages and logical data flows are included in the use case diagram to illustrate the use of the AMT. The diagram provides the context for the Prescribe and Dispense use cases that are detailed in the following sections.

This diagram is not meant to be a comprehensive description of these use cases; further information on electronic prescribing and dispensing and the complete use cases for ETP are available in *ETP 1.1 business requirements* [13] and *ETP concept of operations 1.1* [14].

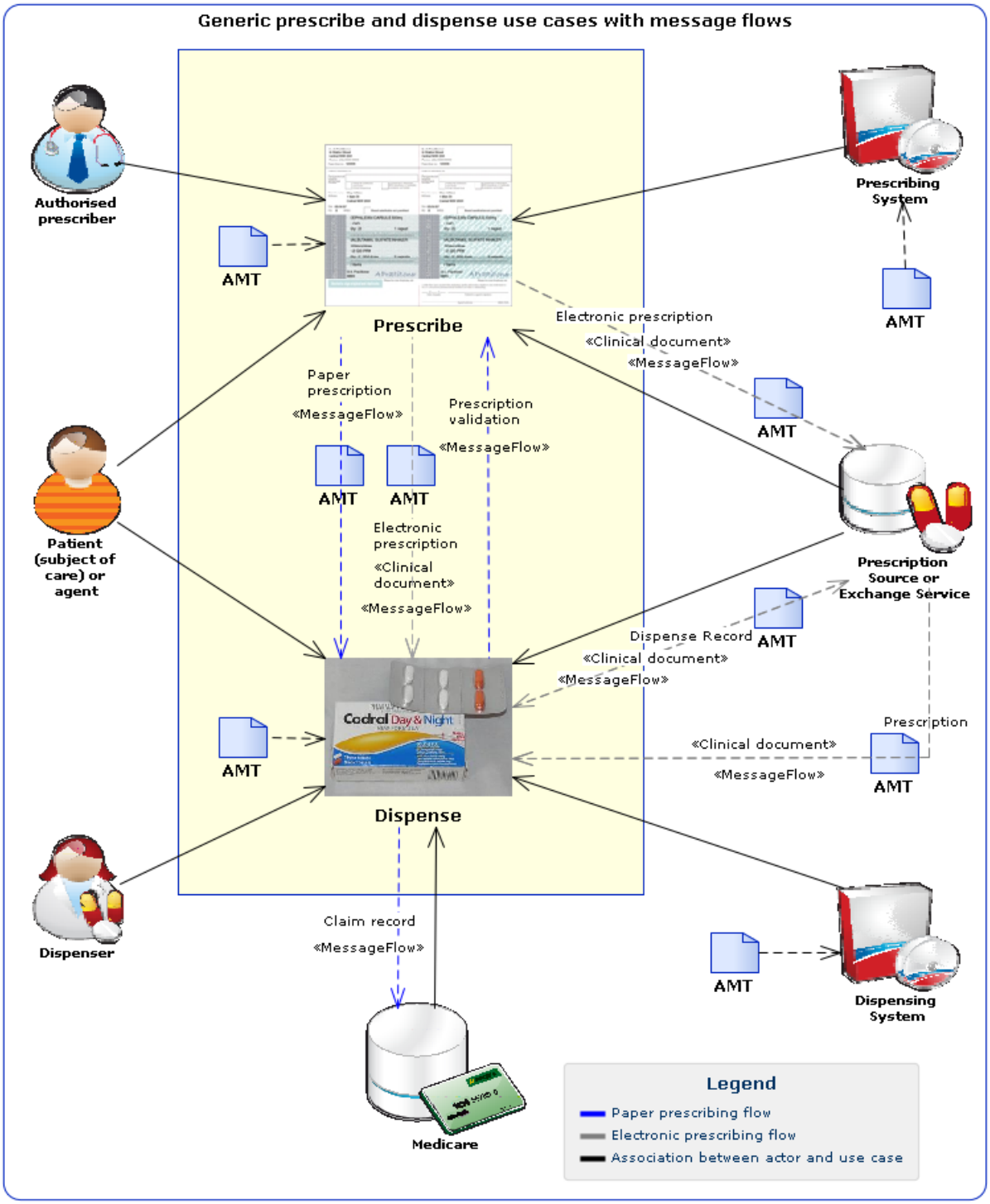


Figure 7: Generic Prescribe and Dispense

4.4 Prescribe use case

The Prescribe use case consists of a paper-based prescription and an electronic prescription. The focus of the use case is to identify the areas where the AMT can provide the medicines terminology needed to support the sourcing and communication of medication information.

It is not the intent of this use case to identify the full sequence of message flows or activities needed for a prescription. See *ETP 1.1 business requirements* [13] for comprehensive details.

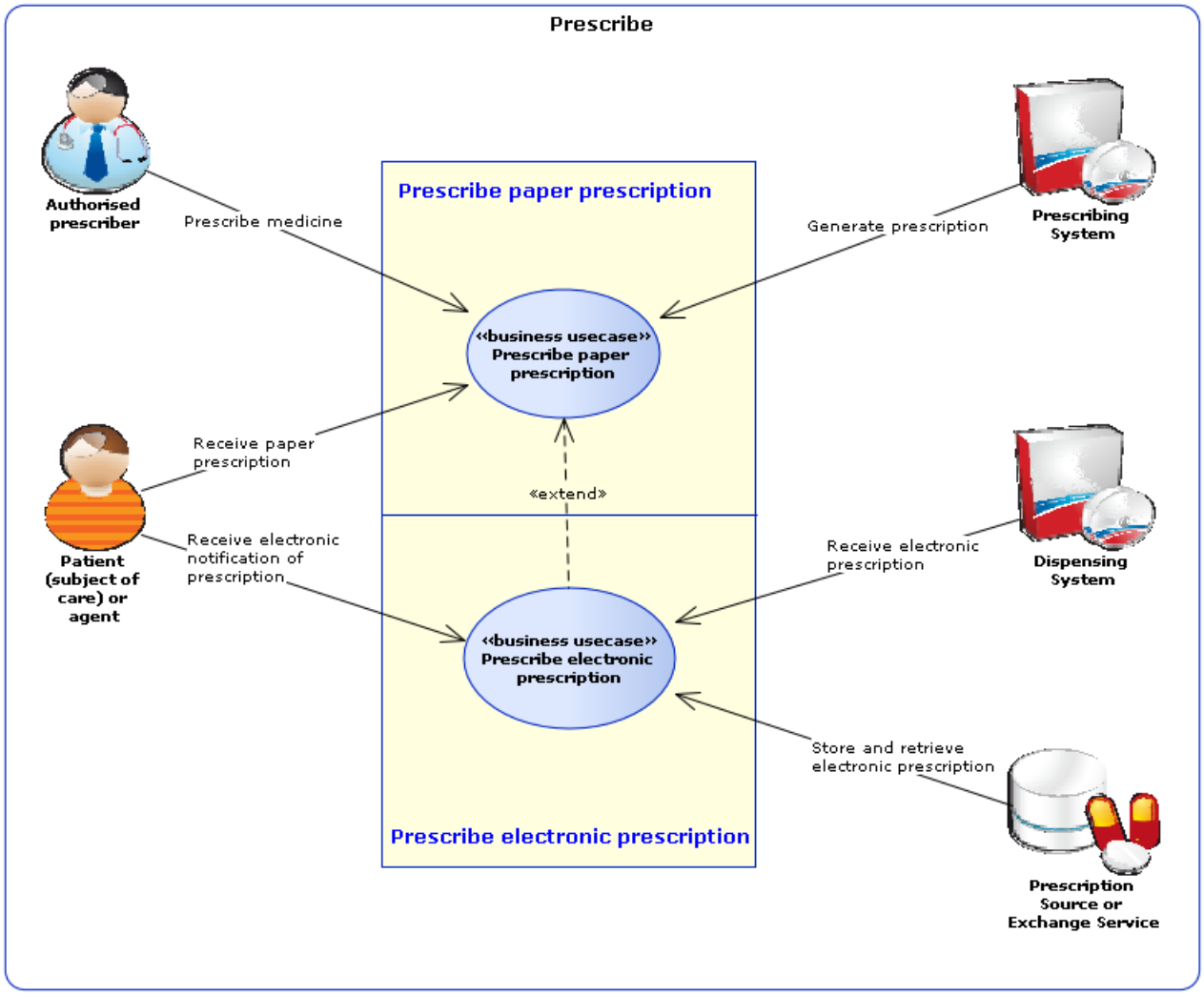


Figure 8: Prescribing use case

Table 3: Prescribing use case details

Name:	**Prescribe**
Goal:	To support using the AMT as the source of the medicines terminology in the prescription of pack-based prescribing by an authorised prescriber, such as a General Practitioner (GP), and to support the generation and exchange of such information in a community-based model involving an authorised dispenser (e.g. a community pharmacy). See the additional note for a sample list of categories of medicines that the AMT will support for a pack-based dispense.
Primary Actors:	Authorised prescriber (Role: creating a prescription using the AMT and decision support in prescribing processes where available.) Prescribing system (Role: providing access to AMT Terminology to support creation of a prescription.) Patient (subject of care) or agent (Role: receive a prescription.)

Other Actors:	Prescription Source or Exchange Service (Role: supporting storage, query and/or retrieval of electronic prescription and dispense records.) Dispensing system (Role: receiving an electronic prescription from the prescribing system or supporting retrieval of the electronic prescription from the Prescription Source or Exchange Service.)
Assumptions:	The prescribing system has a native implementation of the AMT using concept identifiers and preferred names and the prescriber chooses to prescribe using the AMT. PBS data utilised by prescribing system has embedded AMT concept identifiers and Preferred Terms. Alternatively, prescribing systems with mapped implementation of the AMT will replace the AMT with proprietary terminology in the applicable flows.
Exclusions:	Dose-based prescribing is currently not supported in the AMT model. Refer to the *AMT roadmap* [3] for further details.
Precondition	The prescribing system software has an implementation of the AMT.
Main Flow of events	**Paper prescription**
1	The patient (Subject of Care) or agent visits an authorised prescriber, usually a GP.
2	The authorised prescriber examines the patient, reviews the medical history and management plan.
3	The authorised prescriber enters management plan into the Electronic Medical Record (EMR) system and prescribes medication using the prescribing system.
4	The prescribing system software searches for products based on AMT MPUU, MPP, TPUU, TPP and CTPP concepts.
5a	AMT preferred terms are used as display names for the medicines in the prescriptions printed and in the medication lists, referrals, summary health records that may be updated at the time of creating the prescription. The medication lists, referrals, summary health records are not considered to be in scope of this use case and will be discussed in their appropriate uses case outside of this document.
6a	The authorised prescriber provides the patient with a paper prescription.
Extended Flow of events	**Electronic prescription**
5b.1	The authorised prescriber signs the prescription.
5b.2	The prescribing system lodges the prescription with the prescription source or prescription exchange service (PES).
5b.2.1	Alternately, the prescribing system lodges the prescription with the dispensing system.
6.b.1	The authorised prescriber provides the patient (subject of care) or agent with an electronic notification of the Prescription.
6.b.2	Alternately, a paper notification or prescription can be provided to the Patient (Subject of Care) or agent for the electronic prescription.

Post Conditions	The patient (subject of care) or agent receives the appropriate medication prescription. Paper prescription: The prescribing system is updated with the prescription details. Electronic prescription: The prescription information is available in the PES and the prescribing and dispensing systems for the actions that have occurred. If the organisations and Subject of Care participate in the PCEHR, the PCEHR is updated (see *PCEHR concept of operations* [9]).
Additional Notes	The AMT will support pack-based prescribing that include multiple medications for various categories of medicines and scenarios such as: • Prescribed for the first time (new): antibiotics, oral medicines, injections, topical preparations, combination pack, modified release medicines etc. • Prescribed for repeat prescription (repeats): long term medicines etc. • Prescribed for re-supply of prescription: long term medicines, inhaler, anticoagulant, eye drops, tablets, etc. • Prescribed in clinics: vaccines etc. • Prescribed with increased dosage: antihypertensive etc. • Prescribed for out of scope: enema (to buy from pharmacy) etc. • Prescribed for various dose forms.

4.5 Dispensing use case

The Dispense use case consists of a dispense being made for a paper-based prescription or an electronic prescription. The focus of the use case is to identify the areas where the AMT can provide the medicines terminology needed to support the sourcing and communication of medication information.

It is not the intent of this use case to identify the full sequence of message flows or activities needed for a dispense. See *ETP 1.1 business requirements* [13] for comprehensive details.

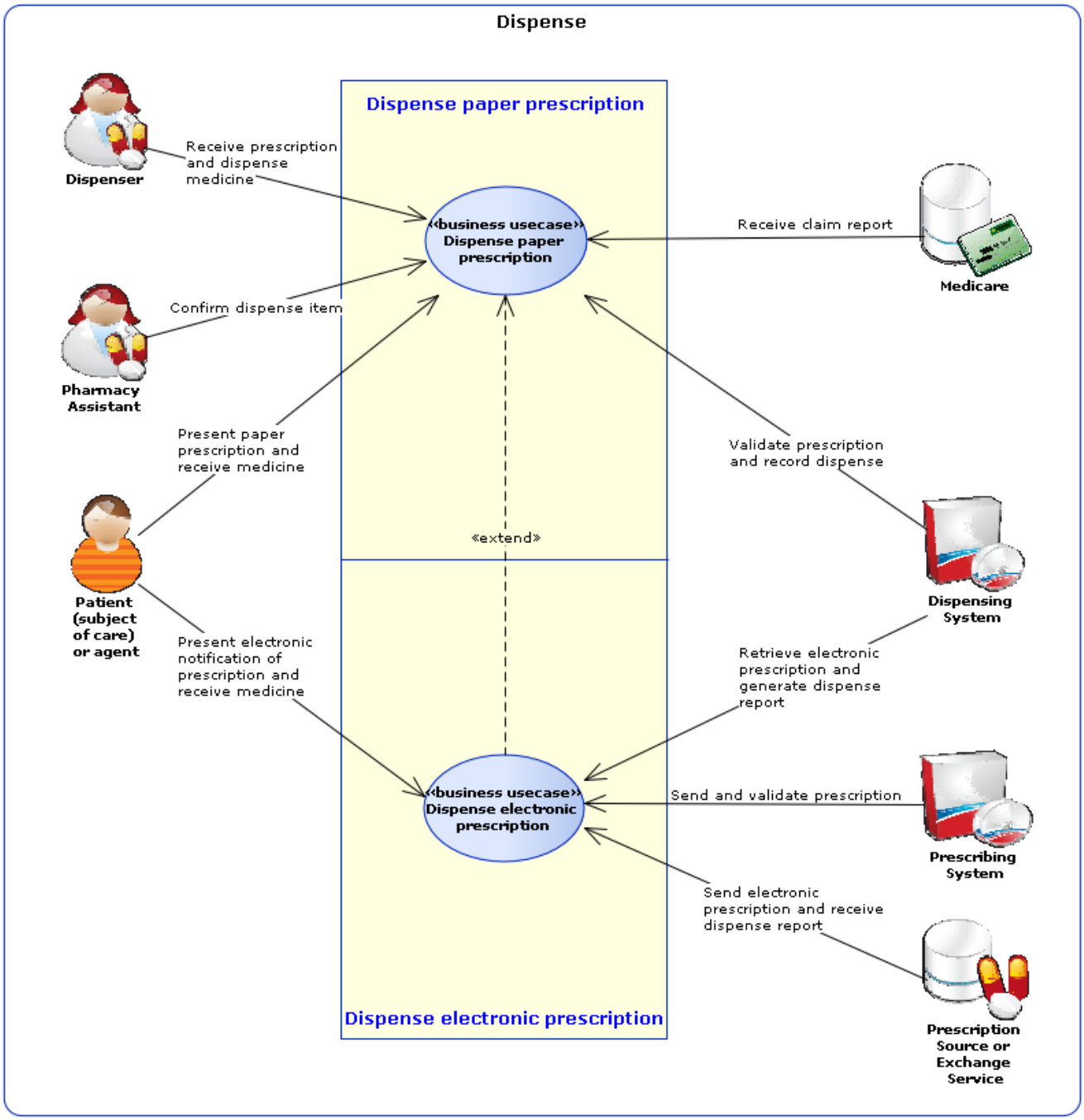


Figure 9: Dispensing use case

Name:	**Dispense**
Goal:	To support the documentation of pack-based dispensing by an authorised dispenser; and to support the generation and exchange of such information in a community-based model using the AMT as the source of the medicines terminology to dispense medicines. To support using the AMT as the source of the medicines terminology in the dispensing of pack-based prescription by an authorised dispenser (e.g. community pharmacist) and to support the generation and exchange of such information in a community-based model involving an authorised prescriber (e.g. a GP). See the additional notes below for a sample list of categories of medicines that the AMT will support for a pack-based dispense.

Primary Actors:	Dispenser (Role: dispensing and supplying medicines as per prescribed instructions; using AMT Terminology and decision support in dispensing processes where available.) Dispensing system (Role: receive an electronic prescription from the prescribing system or retrieve the prescription from the Prescription Source or Exchange Service.) Patient (subject of care) or agent (Role: receive a dispense.) Pharmacy Assistant (Role: confirm the prescribed item's availability for dispense when applicable.)
Other Actors:	Prescription Source or Exchange Service (Role: supporting storage, query and/or retrieval of prescription and dispense records.) Prescribing system (Role: supporting prescription and transmission of prescription to dispense system or prescription exchange service.) Medicare (Role: receives the claim record for the dispense item/s as applicable.)
Assumptions:	The dispensing system has a native implementation of the AMT using concept identifiers and preferred names and the dispenser chooses to dispense using the AMT. PBS data utilised by dispensing system has embedded AMT concept identifiers and preferred names. The existing prescription and dispense record are based on AMT concept identifiers and preferred names. Alternatively, dispensing systems with mapped implementation of the AMT will replace the AMT with proprietary terminology in the applicable flows.
Exclusions:	Dose-based dispensing is currently not supported in the AMT model. Refer to the *AMT roadmap* [3] for details.
Main flow of events	**Dispense for paper prescription**
1a	The patient (subject of care) or agent visits the community pharmacy and presents a paper prescription to have the prescription dispensed.
2	The pharmacy assistant confirms items to be dispensed as applicable.
3	The prescription is reviewed by pharmacist (prescription check) to 'assess the request to supply'.
4	The pharmacist retrieves the patient record. This can be an electronic record.
5	The pharmacist checks that the prescription complies with legal and PBS requirements.
6	The pharmacist checks that the dispensing history and demographics match.
7	The dispensing system shows AMT preferred names using TPPs.
8	Product selections are based on the AMT preferred name for the TPP concept that is aligned to the PBS product.
9	Generic brands that are not applicable or not stocked by the dispenser are not displayed.

10	The authorised dispenser dispenses and supplies the Medication in accordance with the Prescription presented by the patient (subject of care) or agent.
11a	The dispensing system records details that the patient has been supplied with Consumer Medication Information. (The AMT supports linkage to relevant consumer medication information, and the system records what has been provided to the patient.)
11	The dispensing system sends a claim record to Medicare as applicable.
Extended flow of events	**Dispense for Electronic prescription**
1b	The patient (subject of care) or agent visits the community pharmacy and present electronic notification of prescription to have the prescription dispensed
1c	The dispensing system retrieves the prescription from the dispensing system or from the prescription source or prescription exchange service.
11b	The authorised dispenser creates and signs the Dispense Record.
11c	The dispensing system lodges the dispense record with the prescription source or prescription exchange service (PES).
Post Conditions	Dispense for basic prescribe: The patient (subject of care) or agent receives the appropriate medication prescribed. Dispense for electronic prescription: The dispensing system electronically lodges the Dispense Record in the PES and dispensing systems for the actions that have occurred. If the organisations and Subject of Care participate in the PCEHR, the PCEHR is updated (see *PCEHR concept of operations* [9])
Additional notes:	The AMT will support pack-based dispensing that include multiple medications for various categories of medicines and scenarios such as: • Dispensed for the first time (new): antibiotics, oral medicines, injections, topical preparations, combination pack, modified release medicines etc. • Dispensed for repeat prescription (repeats): long term medicines etc. • Dispensed for re-supply of prescription: long term medicines, inhaler, anticoagulant, eye drops, tablets, etc. • Dispensed in clinics: vaccines etc. • Dispensed with increased dosage: antihypertensive etc. • Dispensed for out of scope: enema (to buy from pharmacy) etc. • Dispensed for various dose forms. Although not within scope of these current use cases there is the opportunity for the decision support application to use any key AMT concept or qualifiers (including substance), appropriate SNOMED CT-AU concepts together with its drug knowledgebase to check for drug-drug interactions, contra-indications including allergies or intolerances, therapeutic duplication and dose range checking. The decision support application flags alerts where appropriate and records resulting actions.

4.5.1 Clinical scenarios

Detailed clinical scenarios have been developed to supplement the use cases above and they are provided for reference in the appendices. (Click on a heading to follow the links below; Alt + left arrow will return to this page.)

These clinical scenarios illustrate several detailed examples of how the AMT product concepts can be used to specify medicines as part of a pack-based prescribing/dispensing clinical workflow.

4.5.2 Suggested implementation opportunities

The clinical scenarios described below incorporate a number of features that indicate some of the implementation opportunities that the AMT v3 affords for developers of clinical information systems:

- The dispensing application software has AMT functionality included. This includes AMT concept identifiers, Preferred Terms and relationships between all notable concepts and relevant qualifier data including AMT substances.
- Search functionality is based on the AMT, including MP, MPUU, MPP, TPUU, TPP and CTPP medication products using brand and active ingredient names. AMT Preferred Terms (or synonyms where available) are used as display names and for printed medication lists, dosage charts for complex dosage regimens and dispensing labels for containers and dose administration aids. Alignment between the AMT and PBS can also allow for the patient's entitlement or DVA status to be taken into account when dispensing medicines where PBS availability is determined by this information. This aspect is not described in these use cases. The AMT also can support brand substitution and identification of brands associated with specific MPUUs or MPPs. AMT identifiers can also facilitate linkage to Consumer Medication Information, Cautionary and Advisory labels via reference sets and support requirements for Electronic Recording and Reporting of Controlled Drugs (ERRCD).

Some other implementation opportunities beyond those illustrated in these scenarios are as follows:

- There is the opportunity for the decision support application to use any key AMT concept or qualifiers (including Substance), appropriate SNOMED CT-AU concepts together with its drug knowledge base to check for drug-drug interactions, contra-indications including allergies or intolerances, therapeutic duplication and dose range checking. The decision support application flags alerts where appropriate.
- AMT linkage to GTIN bar codes, while not supported at this time, is also a future potential key development in support of product scanning for safe prescribing and recording of OTC usage and recording the resulting actions.

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Appendix A Clinical scenario 1

A.1 Clinical narrative overview

A.1.1 Prescription processes narrative including use of the AMT

- A GP performs pre-winter season medical review of his Type 2 DM patient.
- The GP reviews the treatment plan for patient's ongoing medical problems and new problems of infected puncture wound on left big toe sustained two days ago and constipation.
- The GP provides the patient with a prescription for long term medications and adjustment of antihypertensive medication (increased dosage), new antibiotic prescriptions for infected toe wound, gives tetanus and flu vaccine shots to the patient at the clinic, and recommends patient to buy Microlax enema from local community pharmacy (note – this medication is not dispensed, therefore is out of scope).
- The GP enters the new management plan in the patient's Electronic Medical Record (EMR) and prescribes the medications as specified in the treatment plan.
- The GP prescribing software has a built-in decision support function.
- The prescribing software provides a search function based on the AMT including MP, MPUU, MPP, TPUU, TPP and CTPP medication products using brand and medicinal names for the following products:
  - Lantus SoloStar 100 international units/mL injection: solution
  - ramipril 5 mg tablet
  - Lasix 40 mg tablet
  - Lipitor 40 mg tablet
  - Cartia 100 mg tablet
  - Nexium 40 mg tablet: enteric
  - Augmentin Duo 500/125 tablet
  - Panamax Co tablet.
  - ADT Booster injection, 1 x 0.5 mL syringe
  - Fluarix 2012 injection: suspension
  - Microlax enema
- AMT Preferred Terms (or synonyms where available) are used as display names for printed medication lists, referrals, summary health records or prescriptions. AMT identifiers and Preferred Terms also support electronic transfer of information including prescriptions.
- Although not within scope of these current use cases there is the opportunity for the decision support application to use any key AMT concept or qualifiers (including Substance), appropriate SNOMED CT-AU concepts together with its drug knowledgebase to check for drug-drug interactions, contra-indications including allergies or intolerances, therapeutic duplication and dose range checking. The decision support application flags alerts where appropriate and records the resulting actions.

Note: These clinical stories do not consider the patient's entitlement of DVA status. Also see Appendix A.3.

A.1.2 Dispensing scenario

- Mike Graham visits his local pharmacy to have the prescription items dispensed. On arrival, a shop assistant receives the prescription and determines what items are to be dispensed. In this case all items on the prescription are to be dispensed. He is also asked if a cheaper brand can be dispensed if available. The patient agrees that this can be done. An identification slip is given to the patient who will return to collect the items in approximately one hour.
- The prescription is initially reviewed by the pharmacist to ensure it is complete, that it complies with legal and PBS requirements, and is clear and understandable.
- The pharmacist retrieves the patient's electronic record with details of the past dispensing history. The pharmacist checks to ensure that the correct patient record has been selected. An initial scan of the prescription items is performed and compared to the existing dispensing record to determine if there is consistency or that changes are reasonable. The existing record is based on AMT Preferred Terms. Obvious drug interactions are also identified. Other checks include – existing drug allergies, multiple items from the same therapeutic class, dose and directions, potential contra-indications and age implication. Relevant precautions are also identified. Any issues requiring clarification or potential alteration are followed up with the prescriber. As noted in the Assumptions (Appendix A.3.1), these use cases do not address AMT's facilitation of decision support. However, if this was the case the AMT would be a key component.
- Each prescription item is then entered into the computer system.
- Each medication is entered as a search criterion, a match found and selected. Alerts are checked, each item is accepted for dispensing and labels generated and printed.
- Items are dispensed.

Note: See A.3 for further details on dispensing and the AMT.

A.2 Scenario 1: Prescribing in detail

A.2.1 Event / encounter trigger

- A 58-year-old male patient, Mike Graham, attends his regular GP clinic for quarterly nursing and pre-winter season medical review of his Type 2 DM condition and management.
- Patient also informed his GP of a puncture wound on his left big toe sustained two days ago.

A.2.2 Medical history

- Type 2 DM (onset/diagnosed at 44 years of age)
- Hypercholesterolaemia (onset/diagnosed at 40 years of age)
- Hypertension (onset/diagnosed at 50 years of age)
- GORD (onset/diagnosed at 57 years of age)
- Lifestyle History:
  - Smoking: non smoker
  - Alcohol: social drinker; 1-2 standard drinks every week

A.2.3 Allergy / intolerance list

No known allergy or intolerance to medications or non-medicinal substances.

A.2.4 Medications

Medicine	Dosage
Lantus SoloStar 100 units/mL) injection, cartridge	13 units once daily in the morning
ramipril 2.5 mg tablet	2.5 mg once daily in the morning
Lasix 40 mg tablet	80 mg in morning and 40 mg in mid-day
Lipitor 40 mg tablet	40 mg daily at night
Cartia 100 mg tablet: enteric	100 mg daily in the morning
Nexium 40 mg tablet: enteric	40 mg daily at night

Note: This medication list displays the AMT Preferred Term for either the MPUU or TPUU and the associated dose. The TPUU shown is based on the AMT v3 format.

A.2.5 On examination and review

- Blood Tests from previous medical review show HbA1c and renal function within normal range, no microalbuminuria, mildly raised Chol/HDL ratio.
- Blood pressure measurement average over 7 days prior to current review shows hypertension not well controlled.
- BMI: 30.80 (moderately obese).
- Wound: puncture wound (2.5 cm) on left big toe caused by a garden fork two days ago. Wound inflamed with small amount of purulent discharge. Patient complains of moderate level of throbbing pain.
- GI: patient complains of constipation for 3 days.

A.2.6 Problem / diagnosis identified this visit

- Poor blood pressure control
- Moderate obesity
- Constipation
- Infected left toe wound

A.2.7 Management plan

- Better blood pressure (target 130/80) control through:
  - Increased dosage of ramipril, exercise and healthy eating.
- Continue other current medications: new prescriptions required for continuing supply.
- New prescription for oral antibiotic, analgesic and Microlax enema.
- Wound swab, clean wound with antiseptic.
- Recommend high fibre diet and increase daily fluid intake.

- Tetanus vaccine booster dose administered in the clinic:
  - ADT Booster injection, 1 x 0.5 mL syringe (Entry of tetanus vaccination in EMR will trigger allergy/intolerance and other contraindication checks by DSS application)
- Flu vaccine administered in the clinic:
  - Fluarix 2012 injection, 1 x 0.5 mL syringe (Entry of vaccination in EMR will trigger allergy/intolerance and other contraindication checks by DSS application)
- Microlax enema, 4 x 5 mL. Dose: one daily x 3-4 days. Patient is advised to purchase this OTC medication from his local community pharmacy but in this scenario, it is treated as dispensed. (Entry of the Microlax enema in the EMR will trigger allergy/intolerance and other contraindication checks by DSS application)
- Referral to dietician and exercise physiologist for weight control and improve blood pressure
- Follow up in 5 days for toe infection

Note: Vaccine names displayed are AMT TPP Preferred Terms. The associated AMT concept IDs (and Preferred Terms) are recorded as part of the immunisation record for the Shared Health Summary.

A.2.8 Prescription

- Lantus SoloStar 100 units/mL injection, 5 x 3 mL cartridges. Dose: 13 units daily in morning.
- ramipril 5 mg tablet, 30; 3 repeats. Dose 5 mg once daily in the morning.
- Lasix 40 mg tablet, 100, bottle. Dose: 80 mg in morning and 40 mg in mid-day.
- Lipitor 40 mg tablet, 30 blister pack; 5 repeats. Dose: 40 mg daily at night.
- Cartia 100 mg tablet: enteric, 168, blister pack. Dose: daily in the morning.
- Nexium 40 mg tablet: enteric, 30, blister pack. 5 repeats. Dose: 40 mg daily at night.
- Augmentin Duo 500/125 tablet, 10, blister pack; 1 repeat. Dose: 1 three times daily till finished.
- Panamax Co 500/8 tablet x 40 tablets. Dose 1 four times daily PRN.
- Microlax enema, 4 x 5 mL. Dose: one daily x 3-4 days.

Note: The prescription details display the AMT Preferred Term for either the MPP or TPP and the associated dose. Unnecessary dose form information is suppressed.

A.3 Scenario 1: Dispensing in detail

A.3.1 Assumptions

Assumption	AMT Utilisation
The patient normally visits this pharmacy to have prescriptions dispensed and has an existing electronic medication record in the pharmacy's computer system.	Information stored includes relevant AMT concept Preferred Terms and identifiers.
The prescription has been generated by a GP desktop system and is not hand-written.	AMT Preferred Terms are printed on the prescription.
The prescription complies with legal and PBS requirements.	PBS data utilised by vendor systems (GP and pharmacy) has embedded AMT concept identifiers and Preferred Terms.
Sex, pregnancy and breast feeding considerations are excluded.	Not applicable.
Unless specifically noted, no issues need to be followed up with the prescriber.	Not applicable.
The patient does not require any Dose Administration Aids.	Potential for the AMT to support labelling of these containers through use of synonyms.
Prescriptions do not have a bar code to linking to any prescription storage repository.	Not applicable.
Dispensing system shows AMT Preferred Terms. Note that unnecessary dosage form detail may be omitted. Synonyms are also available to support label size limitations.	Use of relevant AMT Preferred Terms for TPPs.
Product selections are based on the TPP concept as this aligns to the PBS product.	Use of relevant AMT Preferred Terms for TPPs.
All items will be dispensed even if available as an over-the-counter product.	Not applicable. Note – there is the potential to support recording of OTC items based on the scan of the GTIN bar code through the Point of Sale (POS) system with population of the patient's record based on the AMT to provide a complete medication history.
Generic brands for non-relevant pharmacy chains are not displayed.	Unwanted AMT concepts and Preferred Terms excluded by application.
The Pharmacy dispensing application records details that patient has been supplied with relevant Consumer Medication Information.	The AMT supports linkage to relevant Consumer Medication Information and the system records what has been provided to patient.

Assumption	AMT Utilisation
Decision support use cases concerning drug-drug interactions etc. have been excluded.	Although not within scope of these current use cases there is the opportunity for the decision support application to use any key AMT concept or qualifiers (including Substance), appropriate SNOMED CT-AU concepts together with its drug knowledgebase to check for drug-drug interactions, contra-indications including allergies or intolerances, therapeutic duplication and dose range checking.

A.3.2 Dispensing process – general / key aspects

A.3.2.1 Prescription check

Patient Details

- Name
- Address
- Phone or mobile number
- Any other contact
- Concessional entitlements
- Medicare number
- Allergies
- Date of birth
- Body weight

Prescription details

- Date
- Doctor's signature
- S4 requirements (if required)
- S8 requirements (if required)
- Authority approval (if required)
- Warrant approval (if required)
- Substitution option

A.3.3 Other considerations

The original copy of the prescription should be used as the source for entered data. Following data entry the following should be considered:

- Electronic prescription data matches patient and prescription details.
- Medication profile has been checked for consistency of treatment and compliance.
- Interactions.
- Evidence of misuse.
- Computer software used to select and record any brand change.

- Ensure that the prescriber's intended specific directions are printed on the label.
- Generate labels with one per pack if multiple packs, repeat authorisations and Consumer Medication Information where applicable.
- Product selection based on drug name, strength, quantity and form.

A.3.4 Labelling

This process should include checking:

- Expiry date of product.
- Labelled directions against original prescription.
- Drug, strength and quantity against the pharmacist's original copy of the prescription.
- Appropriate cautionary and advisory labels have been applied.
- Important information on manufacturer's label has not been obscured – product name, strength, expiry date, batch number etc.

A.3.5 Clinical story 1 – dispensing scenarios

- Mike Graham visits his local pharmacy to have the prescription items dispensed. On arrival a shop assistant receives the prescription and determines what items are to be dispensed. In this case all items on the prescription are to be dispensed. He is also asked if a cheaper brand can be dispensed if available. The patient agrees that this can be done. An identification slip is given to the patient who will return to collect the items in approximately one hr.
- The prescription is initially reviewed by the pharmacist to ensure that it is complete, that it complies with legal and PBS requirements, and is clear and understandable.
- The pharmacist retrieves the patient's electronic record with details of the past dispensing history. The pharmacist checks to ensure that the correct patient record has been selected. An initial scan of the prescription items is performed and compared to the existing dispensing record to determine if there is consistency or that changes are reasonable. The existing record is based on AMT Preferred Terms. Obvious drug interactions are also identified. Other checks include:
    - existing drug allergies;
    - multiple items from the same therapeutic class;
    - dose and directions;
    - potential contra-indications; and
    - age implication.
- Relevant precautions are also identified. Any issues requiring clarification or potential alteration are followed up with the prescriber. As noted in assumptions these use case do not address AMT facilitation of decision support. However, if this was the case the AMT would be a key component.
- Each prescription items is then entered into the computer system.

A.3.5.1 Item 1: Lantus SoloStar

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

'Lantus SoloStar' is entered as the search criterion. Only one item matches and is automatically selected:

'Lantus SoloStar 100 international units/mL injection: solution, 5 x 3 mL cartridges'.

This product is associated with the PBS code 9039R.

Directions entered:

- Inject 13 units subcutaneously daily in the morning.
- Quantity: 1 pack of 5 x 3 mL cartridges.
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

The following cautionary and advisory labels are identified as required:

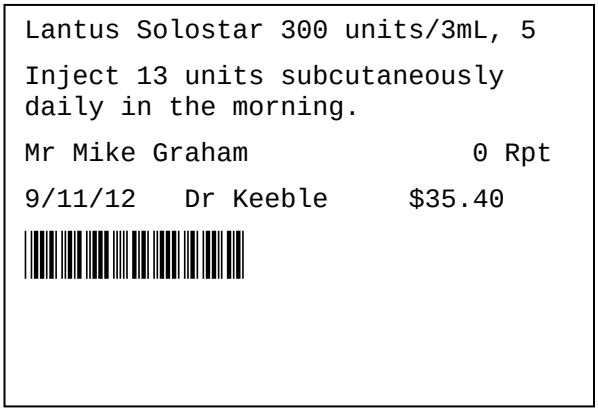
Label 6 – REFRIGERATE
Do Not Freeze

Label 7a – Discard 30 days after opening
Date opened / /

Label 10a - Do not take more than one aspirin tablet or capsule each day while being treated with this medicine.

Identification of required Cautionary and Advisory labels could be facilitated through use of the AMT and additional data derived from the Australian Pharmaceutical Formulary (APF) contained in a reference set.

The label is generated and printed:



This label is displays an automatically generated bar code to identify the item dispensed. Note that a synonym for the TPP is displayed on the label that is less than 36 characters.

One pack of Lantus SoloStar is selected from the refrigerator and labelled with the dispensing and cautionary and advisory labels. The GTIN bar code is scanned to ensure that the correct product has been dispensed. See below Prescription Scanning for more information.

A.3.5.2 Item 2: ramipril

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

'ramipril 5 mg' is entered as the search criterion.

Matching MPUU and MPPs displayed:

- ramipril 5 mg capsule
- ramipril 5 mg tablet
- ramipril 5 mg capsule, 30
- ramipril 5 mg tablet, 7
- ramipril 5 mg tablet, 10
- ramipril 5 mg tablet, 21
- ramipril 5 mg tablet, 30

'ramipril 5 mg tablet, 30' is selected and matching TPPs are displayed:

- Prilace 5 mg tablet, 30 tablets
- Ramace 5 mg tablet, 30 tablets
- Ramipril (APO) 5 mg tablet, 30 tablets
- Tritace 5 mg tablet, 30 tablets
- Tryzan 5 mg tablet, 30 tablets
- Vascalace 5 mg tablet, 30 tablets

'Ramipril (APO)' is selected as the generic brand.

This product is associated with the PBS code 1946K.

Directions entered:

- Take ONE tablet daily in the morning.
- Quantity: 30
- Repeats: 3

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

The following cautionary and advisory labels are identified as required:

Label 11 -	DO NOT TAKE POTASSIUM while being treated with this medicine unless advised by your doctor.
Label 12 -	This medicine may affect mental alertness and/or coordination. If affected, do not drive a motor vehicle or operate machinery.
Label 16 -	This medicine may cause dizziness especially when you stand up quickly. Ask your doctor or pharmacist for advice.

Label 12/16 may be required as the dose of ramipril has been increased.

The label is generated and printed together with repeat authorisation.

Ramipril (APO) 5 mg tablet, 30

Take ONE tablet daily in the morning.

Mr Mike Graham 3 Rpt

9/11/12 Dr Keeble $17.32

One box of Ramipril (APO) 5 mg tablets is selected from the stock shelves and labelled with the dispensing and cautionary and advisory labels.

A.3.5.3 Item 3: Lasix

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

'Lasix 40 mg tablet' is entered as the search criterion. In this case brand substitution has not been authorised. The TPP, 'Lasix 40 mg tablet, 100' is selected. This is associated with PBS code 2412Y.

Directions entered:

- 80 mg in morning and 40 mg at mid-day
- Quantity: 100
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 16 - This medicine may cause dizziness especially when you stand up quickly. Ask your doctor or pharmacist for advice.

Although this cautionary and advisory labelled is suggested is not applied as the patient treatment is ongoing and there has been no dose change.

The prescription label is generated.

Lasix 40 mg tablet, 100

Take TWO tablets in the morning and ONE tablet at midday.

Mr Mike Graham 0 Rpt

9/11/12 Dr Keeble $15.97

One bottle of Lasix 40 mg tablets is selected from the stock shelves and labelled with the dispensing label.

A.3.5.4 Item 4: Lipitor (Atorvastatin)

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

Prescription item:

- Lipitor (Atorvastatin) 40 mg tablet, film-coated, 30/box x 1; 5 repeats. Dose: 40 mg daily at night

'Lipitor 40 mg tablet' is entered as the search criterion. In this cause brand substitution has not been authorised.

The following TPPs are displayed:

- Lipitor 40 mg tablet, 10
- Lipitor 40 mg tablet, 30

'Lipitor 40 mg tablet, 30' is selected. This is associated with PBS codes 8215J (5 repeats) and 9232X (11 repeats). (This is an example of where one AMT concept is linked to multiple PBS codes. In this case the prescribing rule associated with 5 repeats is appropriate.)

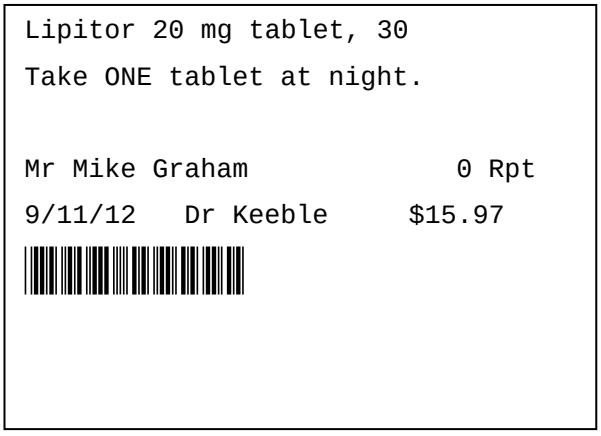
Directions entered:

- 40 mg at night
- Quantity: 30
- Repeats: 5

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 18 - Avoid eating grapefruit or drinking grapefruit juice while being treated with this medicine.

The prescription label and repeat authorisation form are generated.



A.3.5.5 Item 5: Cartia

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

Prescription item:

- Cartia 100 mg/tablet 168 tablet/box x 1 box. Dose: daily in the morning.

'Cartia' is entered as the search criterion. The following matching entries are displayed:

- Cartia 100 mg tablet: enteric, 28
- Cartia 100 mg tablet: enteric, 84
- Cartia 100 mg tablet: enteric, 168

The 168 tablet packsize is selected.

Directions entered:

- 100 mg daily in the morning
- Quantity: 168
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 13 - Do not remove from original packaging until dose required.

Label A - SWALLOW WHOLE
Do not crush or chew

Label B - TAKE WITH OR SOON AFTER FOOD

The prescription label is generated.

```
Cartia 100 mg tablet, 168
Swallow ONE tablet whole daily in the
morning.

Mr Mike Graham                0 Rpt
9/11/12   Dr Keeble     $13.99
```

A.3.5.6 Item 6: Nexium (Esomeprazole)

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

Prescription item:

- Nexium (Esomeprazole) 40 mg/tablet, 30/box x 1; 5 repeats. Dose: 40 mg daily at night.

'Nexium 40 mg' is entered as the search criterion and the following TPPs are displayed:

- Nexium 40 mg tablet: enteric, 30 tablets
- Nexium 40 mg tablet: enteric, 100 tablets

The 30 pack size selected to match the prescription quantity.

Directions entered:

- 40 mg daily at night
- Quantity: 30
- Repeats: 5

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label A - SWALLOW WHOLE
Do not crush or chew

The prescription label and repeat authorisation form are generated.

```
Nexium 40 mg tablet, 30
Take ONE tablet daily at night.

Mr Mike Graham              5 Rpt
9/11/12   Dr Keeble      $15.97
```

A.3.5.7 Item 7: Augmentin Duo

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

Prescription item:

- Augmentin Duo 500/125 tablet x 20 tablets. Dose: 1 three times daily till finished.

'Augmentin Duo 500' is entered as the search criterion and the following TPPs are displayed:

- Augmentin Duo 500/125 tablet, 2
- Augmentin Duo 500/125 tablet, 10
- Augmentin Duo 500/125 tablet, 60

The 10 tablet pack size is selected.

Note: Although Augmentin Duo has an associated Brand Price Premium this is the item that will be dispensed.

The 10 pack size is selected to match the prescription quantity.

Directions entered:

- 1 tablet three times a day until finished
- Quantity: 10
- Repeats: 1

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 13 - Do not remove from original packaging until dose required.

Label F - TAKE IMMEDIATELY BEFORE FOOD

The prescription label and Consumer Medication Information are printed.

```
Augmentin Duo 500/125 tablet, 10
Take ONE tablet three times a day
until finished.

Mr Mike Graham              1 Rpt
9/11/12   Dr Keeble     $16.90
```

A.3.5.8 Item 8: Panamax Co

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

Prescription item:

- Panamax Co 500/8 tablet x 40 tablets. Dose: 1 four times daily PRN.

'Panamax Co' is entered as the search criterion and the following products are displayed:

- Panamax Co tablet, 40

This product is selected for dispensing.

Directions entered:

- 500 mg four times daily when required
- Quantity: 40
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 13 - Do not remove from original packaging until dose required.

Label 19 - Contains PARACETAMOL
Consult your doctor or pharmacist if taking other paracetamol products.

The prescription label and Consumer Medication Information are printed.

```
Panamax Co tablet, 40

Take ONE tablet four times a day
when required.

Do NOT take more than 8 tablets
per day.


Mr Mike Graham              0 Rpt

9/11/12   Dr Keeble
```

A.3.5.9 Item 9: Microlax enema

(See Appendix A.2.8 for a summary of the prescription in this scenario.)

Prescription item:

- Microlax enema, 4 x 5 mL. Dose: one daily x 3-4 days.

Search criterion: 'Microlax'.

Search results (as TPP):

- Microlax enema, 4 x 5 mL
- Microlax enema, 12 x 5 mL

The 4 x 5 mL pack size is selected.

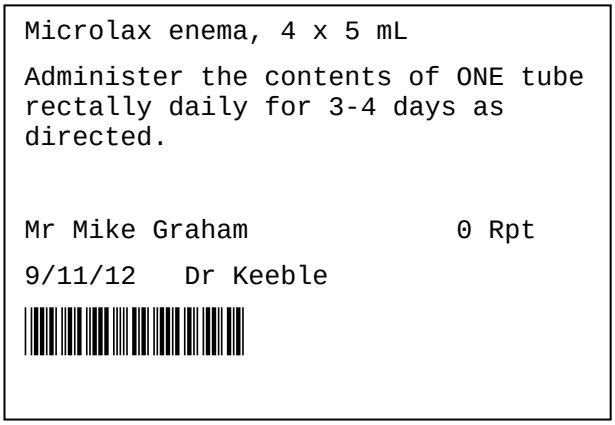
Directions entered:

- One daily

- Quantity: 4
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

The prescription label and Consumer Medication Information are printed.



A.3.6 Prescription scanning

As part of the dispensing process, the generated bar code on each prescription item's label is scanned and matched against a scan of the actual GTIN (Global Trade Item Number) barcode on the manufacturer's pack. This ensures that the physical item being dispensed matches the product recorded in the patient medication record.[7]

A.3.7 Patient counselling

When all items have been completed, checked and scanned, the patient is then counselled about the dispensed items. Specific reference is paid to changes in dose, discontinued items and new items. Additional administration advice may be given as well as details of any important side effects that may occur and how these should be managed. Linkage of the AMT to Consumer Medication Information would facilitate supply of this information to the patient. See the above assumptions (Appendix A.3.1).

A.3.8 Other considerations

Dispensed information could be sent to the National Prescribing and Dispensing Repository (NPDR) using AMT identifiers and Preferred Terms.

[7] For example, the dispensing label barcode may encode the patient identifier/prescription number and this then references the actual product recorded and the associated GTIN recorded in the dispensing application database. The scanning process then compares this with the actual product GTIN and if these match the dispensed product matches the computerised dispensing record.

Appendix B Clinical scenario 2

B.1 Clinical narrative overview

B.1.1 Prescribing processes narrative and use of the AMT

- A GP reviews his 48-year old female patient with medical history of asthma, hay fever and rheumatoid arthritis (RA) who complains of a recent flare up of RA symptoms. The GP reviews the patient's health status, recent complaints, presenting problems and medication history; and determines a new management plan.
- The medication treatment component of the management plan includes new medications for RA flare:
  - DMAR (disease modifying anti-rheumatoid arthritis drug) – methotrexate
  - Folic acid 5 mg tablets
  - Oxycodone 5 mg controlled release tablets
- In addition, a resupply of asthma medication is prescribed:
  - Seretide Accuhaler 500/50 mcg/dose inhaler
- The GP prescribing software has built in decision support function.
- The prescribing software provides search function on AMT MPP, TPP and CTPP medication products using brand and active ingredient names.
- The decision support application uses AMT concepts and its drug knowledgebase to check for drug-drug interactions, contra-indications including allergies or intolerances, and the daily dose threshold for this patient.
- The decision support application picks up drug-drug interaction between methotrexate and NSAID during prescription of methotrexate. It raises the following alert:
  - NSAID-induced increases in methotrexate concentration in serum may cause increased GI and haematological toxicity.
- However, NSAID generally does not result in problems with the methotrexate dose level used to treat patients with rheumatoid arthritis. The prescribing GP can override the drug-drug interaction alert and continues with the prescription.
- The decision support application also alerts the GP on methotrexate – folic acid interactions and recommends that the two medications should not be taken on the same day/time.
- The decision support application also alerts the GP on PPI (esomeprazole) – folic acid interaction (slightly decreases folic acid absorption). The GP considers that the interference is quite small/negligible.

B.1.2 Dispensing overview

- Ms Fiona Gallagher visits her local pharmacy to have the prescription items dispensed. On arrival a shop assistant receives the prescription and determines what items are to be dispensed. In this case all items on the prescription are to be dispensed. She is also asked if a cheaper brand can be dispensed if available. The patient agrees that this can be done. An identification slip is given to the patient who waits for the items to be dispensed.
- The prescription is initially reviewed by the pharmacist to ensure that it is complete, that it complies with legal and PBS requirements, and it is clear and understandable.
- The pharmacist retrieves the patient's electronic record with details of the past dispensing history, and checks to ensure that the correct patient record has been selected. An initial scan of the prescription items is performed and compared to the existing dispensing record to determine if there is consistency or that changes are reasonable. Obvious drug interactions are also identified. Other checks include:
    - existing drug allergies;
    - multiple items from the same therapeutic class;
    - dose and directions;
    - potential contra-indications; and
    - age implication.
- Relevant precautions are also identified. Any issues requiring clarification or potential alteration are followed up with the prescriber.
- Each prescription item is then entered into the computer system.
- Each medication is entered as a search criterion, a match found and selected. Alerts are checked, items are accepted for dispensing and labels generated and printed.
- Items are dispensed.

Note: See Appendix B.3 for further details on dispensing and the AMT.

B.2 Scenario 2: Prescribing in detail

B.2.1 Event / encounter trigger

A 48-year-old female patient, Fiona Gallagher, with history of rheumatoid arthritis presents at her GP clinic to seek treatment for a flare up of the condition.

B.2.2 Medical history

- Rheumatoid arthritis (diagnosed 7 months ago).
- Asthma (diagnosed at 35 years of age following 5 years of hay fever).
- Hay fever (diagnosed at 30 years of age, second year after migration to Australia).

B.2.3 Medications

Medicine	Dosage
Voltaren 50 mg tablet: enteric	50 mg three times daily
Panadeine Forte tablet	1 tablet four times daily, PRN
Nexium 20 mg tablet: enteric	20 mg tablet, once daily at night
Claratyne 10 mg tablet	10 mg once daily
Beconase Allergy and Hayfever 12 Hour 0.05% nasal spray	2 sprays per nostril, twice daily
Seretide Accuhaler 500/50 inhalation: powder for	1 inhalation, twice daily in hay fever season

B.2.4 On examination and review

- Significant swelling of affected joints, red, stiff and painful.
- Low grade fever, tired, irritable, poor appetite.

B.2.5 Problem / diagnosis identified this visit

Exacerbation of rheumatoid arthritis.

B.2.6 Management plan

- Review medications: for better pain management (stop Panadeine Forte, add oxycodone); add DMAR (disease modifying anti-rheumatoid arthritis drug) – methotrexate.
- Heat treatment and rest of affected joints; maintain joint function and prevent loss of range of motion.
- Review in one week.
- Refer to physiotherapy for rehabilitation therapy after acute flare up.
- New prescription for Seretide (as requested by patient).
- Other medications are not required as the patient has sufficient supply.

B.2.7 Prescription

- Methotrexate 2.5 mg tablet, 30. Dose: 7.5 mg, once weekly (review in 1 week for dose adjustment/increase)
- Folic acid 5 mg tablet, 100. Dose: 10 mg, once weekly.
- Seretide Accuhaler 500/50 inhalation: powder for, 60 actuations, blister pack. Dose: 1 inhalation, twice daily.
- Oxycodone hydrochloride 5 mg tablet: modified release, 28. Dose: 5 mg tablet, twice daily.

B.3 Scenario 2: Dispensing in detail

B.3.1 Clinical story 2 – dispensing scenario

- Ms Fiona Gallagher visits her local pharmacy to have the prescription items dispensed. On arrival a shop assistant receives the prescription and determines what items are to be dispensed. In this case all items on the prescription are to be dispensed. She is also asked if a cheaper brand can be dispensed if available. The patient agrees that this can be done. An identification slip is given to the patient who waits for the items to be dispensed.
- The prescription is initially reviewed by the pharmacist to ensure that it is complete, that it complies with legal and PBS requirements, and is clear and understandable.
- The pharmacist retrieves the patient's electronic record with details of the past dispensing history. The pharmacist checks to ensure that the correct patient record has been selected. An initial scan of the prescription items is performed and compared to the existing dispensing record to determine if there is consistency or that changes are reasonable. Obvious drug interactions are also identified. Other checks include:
  - existing drug allergies,
  - multiple items from the same therapeutic class,
  - dose and directions,
  - potential contra-indications and
  - age implication.
- Relevant precautions are also identified. Any issues requiring clarification or potential alteration are followed up with the prescriber.
- Each prescription items is then entered into the computer system.

B.3.1.1 Item 1: Methotrexate

(See Appendix B.2.7 for a summary of the prescription in this scenario.)

Prescription item:

- Methotrexate 2.5 mg tablet, 30. Dose: 7.5 mg, once weekly (review in one week for dose adjustment/increase)[8].

Search criterion: 'Methotrexate'.

The following matches based on MPPs are displayed:

- methotrexate 2.5 mg tablet, 30
- methotrexate 5 g/50 mL injection, 1 x 50 mL vial
- methotrexate 5 mg/2 mL injection, 5 x 2 mL vials
- methotrexate 10 mg tablet, 15
- methotrexate 10 mg tablet, 50
- methotrexate 50 mg/2 mL injection, 5 x 2 mL ampoules
- methotrexate 50 mg/2 mL injection, 5 x 2 mL vials

[8] This raises an interesting issue around constraining the search to just tablets or oral etc. In this case prescription is for a dose and not a strength so search may be less focussed. There is an associated issue of sort order and for a complex list this may be an issue. With a large list there may be a requirement for a 'proper' sort order and also the ability to sort by high level route of administration – oral, topical, injectable etc.

- methotrexate 500 mg/20 mL injection, 1 x 20 mL vial
- methotrexate 500 mg/5 mL injection, 1 x 5 mL vial
- methotrexate 1 g/10 mL injection, 1 x 10 mL vial
- methotrexate 1 g/40 mL injection, 1 x 40 mL vial

As the closest product is the 2.5 mg tablet, this is selected to display relevant TPPs:

- Methoblastin 2.5 mg tablet: uncoated, 30 tablets
- Methotrexate (DBL) 2.5 mg tablet: uncoated, 30 tablets

'Methoblastin' is selected for dispensing. A quantity of 30 has been confirmed by the prescriber and updated prescription is to be forwarded.

Directions entered:

- Take THREE tablets once a week on Monday for 1 week and then as directed by your doctor.
- Quantity: 30
- Repeats: 0

In this case alerts are displayed based on potential for drug interaction with diclofenac, a non-steroidal anti-inflammatory agent. This may result in discussion and clarification with the prescriber and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 8 - Avoid excessive skin exposure to sunlight and sunlamps while being treated with this medicine.

Label 20 - Take once weekly on the same day.

Label 21 - Special handling and disposal required – ask your pharmacist.

The prescription label and Consumer Medication Information are printed[9].

Methoblastin 2.5 mg tablets, 30

Take THREE tablets weekly on Monday for one week and then consult your doctor.

Ms Fiona Gallagher 0 Rpt

19/11/12 Dr Paluzzi $18.37

(This clinical story has an issue regarding the quantity to be supplied. This has not been specified by the doctor and an assumption has been made to dispense 30. This could have been clarified with the doctor who unfortunately was not available. The patient has been directed to consult their doctor after one week for dosage adjustment. However, this may not occur if the patient has a full bottle of 30 tablets. If the patient does see her doctor and the dose is adjusted the labelling does not reflect the new dose. This is a potential safety risk as methotrexate toxicity is a not uncommon problem with patients taking methotrexate for rheumatoid arthritis.)

[9] This label just includes the brand name, but in this case there may be an issue as the item has been ordered as methotrexate and the patient informed by their doctor that methotrexate has been prescribed. So care is needed with counselling.

B.3.1.2 Item 2: Folic acid

(See Appendix B.2.7 for a summary of the prescription in this scenario.)

Prescription item:

- Folic acid 5 mg tablet, 100. Dose: 10 mg, once weekly

Search criterion: 'folic acid'.

The following matches based on MPPs are displayed:

- folic acid 5 mg/mL injection, 5 x 1 mL vials
- folic acid 15 mg/mL injection, 5 x 1 mL ampoules
- folic acid 500 microgram tablet, 100
- folic acid 5 mg tablet, 100

The folic acid entry is selected and the following TPP is displayed:

- Megafol 5 mg tablet: uncoated, 100 tablets

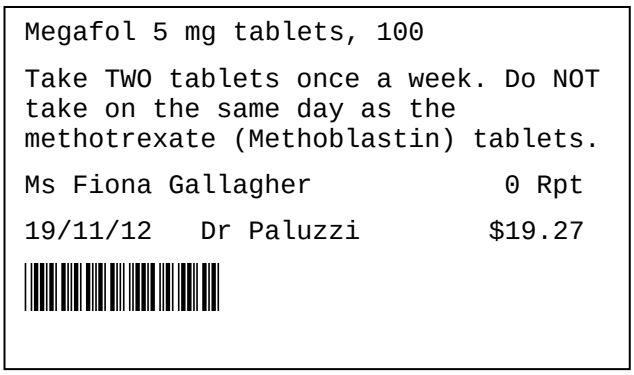
'Megafol' is selected for dispensing.

Directions entered:

- Take TWO tablets once a week. Do NOT take on the same day as the methotrexate (Methoblastin) tablets.
- Quantity: 30
- Repeats: 0

In this case alerts are displayed based on potential for drug interaction with methotrexate. This is alert is noted and has already been taken into account by ensuring that the folic acid and methotrexate tablets are not taken together on the same day.

The prescription label is printed.



B.3.1.3 Item 3: Seretide Accuhaler

(See Appendix B.2.7 for a summary of the prescription in this scenario.)

Prescription items:

- Seretide Accuhaler 500/50 mcg/dose inhaler x 1. Dose: 1 inhalation, twice daily
- Seretide Accuhaler 500/50 inhalation: powder for, 60 actuations, blister pack. Dose: 1 inhalation, twice daily

Search criterion: 'Seretide'.

The following matches based on TPPs are displayed:

- Seretide Accuhaler 100/50 inhalation: powder for, 60 actuations
- Seretide Accuhaler 250/50 inhalation: powder for, 60 actuations
- Seretide Accuhaler 500/50 inhalation: powder for, 60 actuations
- Seretide MDI 50/25 inhalation: pressurised, 120 actuations
- Seretide MDI 125/25 inhalation: pressurised, 120 actuations
- Seretide MDI 250/25 inhalation: pressurised, 120 actuations

'Seretide Accuhaler 500/50 inhalation: powder for, 60 actuations' is chosen for dispensing.

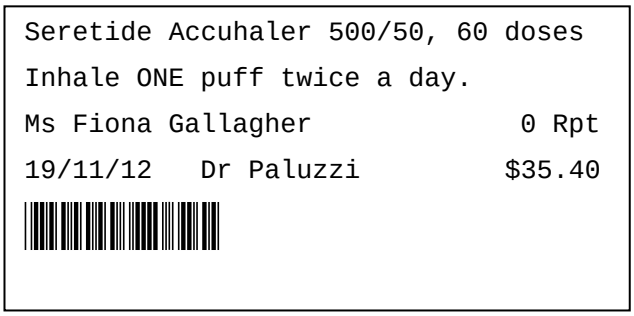
Directions entered:

- Take TWO tablets once a week. Do NOT take on the same day as the methotrexate (Methoblastin) tablets.
- Quantity: 30
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 14 - RINSE MOUTH
with water after each use.

The prescription label is printed.



B.3.1.4 Item 4: Oxycodone hydrochloride

(See Appendix B.2.7 for a summary of the prescription in this scenario.)

Prescription item:

- Oxycodone hydrochloride 5 mg tablet: modified release, 28. Dose: 5 mg tablet, twice daily

It is assumed that the oxycodone has been written on a separate prescription and all legal requirements have been met.

The dispensing record for oxycodone would also be recorded as part of the Electronic Recording and Reporting of Controlled Drugs (ERRCD) where the use of AMT identifiers and Preferred Terms has been mandated. (This may require a reference set to identify controlled drugs.)

Search criterion: 'oxycodone'.

The following matches based on MPPs are displayed:

- oxycodone hydrochloride 5 mg capsule, 20
- oxycodone hydrochloride 5 mg capsule, 60

- oxycodone hydrochloride 5 mg tablet, 20
- oxycodone hydrochloride 5 mg tablet, 500
- oxycodone hydrochloride 5 mg tablet: modified release, 20 tablets
- oxycodone hydrochloride 5 mg tablet: modified release, 28 tablets
- oxycodone hydrochloride 5 mg tablet: modified release, 60 tablets

'Oxycodone hydrochloride 5 mg tablet: modified release, 28 tablets' is selected and the followed TPP is displayed:

- Oxycontin 5 mg tablet: modified release, 28 tablets.

This is on the PBS with item code 881X.

Directions entered:

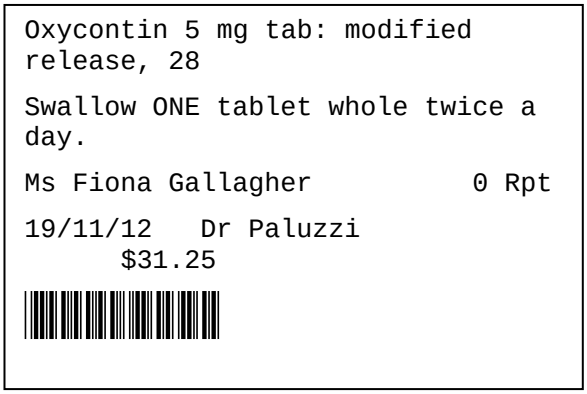
- Swallow ONE tablet whole twice daily
- Quantity: 28 tablets
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 1 - This medicine may cause drowsiness and may increase the effects of alcohol.
If affected, do not drive a motor vehicle or operate machinery.

Label A - SWALLOW WHOLE
Do not crush or chew

The prescription label and Consumer Medication Information are printed.



As with Clinical Story 1, the dispensed items are scanned and matched to the prescription. The patient is counselled with special emphasis on methotrexate, folic acid and oxycodone as new items where care is required. (It would be appropriate to re-iterate that the Panadeine Forte has been ceased but the pharmacist may not be aware of this.) Correct usage of the Seretide Accuhaler may also be confirmed.

Appendix C Clinical scenario 3

C.1 Clinical narrative overview

C.1.1 Prescription processes narrative including use of the AMT

- A 35-year old female patient is admitted into local hospital for treatment of bleeding gastric ulcer. Post emergency_OGD (oesophago-gastro-duodenoscopy) haemostasis, her physician prescribed PPI (esomeprazole) intravenous infusion to reduce the risk of rebleeding.
- She also suffers_relapse of seborrhoeic dermatitis during the current hospitalisation episode.
- On discharge, her physician prescribes the following discharge medications:
  - Nexium Hp7, 1 pack for 7 days for H. Pylori eradication
  - Diprosone OV 0.05% cream, 30 g, topical application for continuing treatment of her seborrhoeic dermatitis
- The hospital prescribing software has built in decision support function.
- The prescribing software provides search function on AMT TPUU, TPP and CTPP medication products using brand and active ingredient names.
- The decision support application uses AMT concepts and its drug knowledgebase to check for drug-drug interactions, contra-indications including allergies or intolerances, and daily dose threshold for this patient. The decision support application does not detect any drug-drug interactions or contra-indications.

C.1.2 Dispensing overview

- Ms Sabrina Carver visits her local pharmacy to have the prescription items dispensed. On arrival a shop assistant receives the prescription and determines what items are to be dispensed. In this case all items on the prescription are to be dispensed. She is also asked if a cheaper brand can be dispensed if available. The patient agrees that this can be done. An identification slip is given to the patient.
- The prescription is initially reviewed by the pharmacist to ensure that it is complete, that it complies with legal and PBS requirements, and is clear and understandable.
- The pharmacist retrieves the patient's electronic record with details of the past dispensing history. The pharmacist checks to ensure that the correct patient record has been selected. An initial scan of the prescription items is performed and compared to the existing dispensing record to determine if there is consistency or that changes are reasonable. Obvious drug interactions are also identified. Other checks include – existing drug allergies, multiple items from the same therapeutic class, dose and directions, potential contra-indications and age implication. Relevant precautions are also identified. Any issues requiring clarification or potential alteration are followed up with the prescriber.
- Each prescription item is then entered into the computer system.
- Each medication is entered as a search criterion, a match found and selected. Alerts are checked, items are accepted for dispensing and labels generated and printed.

- Items are dispensed.

Note: See C.3 for further details on dispensing and the AMT.

C.2 Scenario 3: Prescribing in detail

C.2.1 Event / encounter trigger

- A 35-year-old female patient, Sabrina Carver, was admitted to local hospital suffering from severe bleeding gastric ulcer. Emergency OGD (oesophago-gastro-duodenoscopy) haemostasis was performed by the hospital gastroenterologist.
- Testing on mucosal lining obtained during endoscopy and serology tests confirmed *H. Pylori* infection
- For prevention of peptic ulcer rebleeding, she was prescribed and administered adjunctive PPI infusion therapy: intravenous infusion esomeprazole 40 mg in 100ml 0.9% sodium chloride over 30 minutes as loading dose, then 8 mg/hour for 72 hours.
- She was discharged two days later.
- Her treating physician decided to put her on Helicobacter Pylori eradication regime on discharge.

C.2.2 Medical history

- Peptic (gastric) ulcer diagnosed at 29 years of age, responded to treatment, no relapse until current event
- Seborrhoeic dermatitis diagnosed at 13 years of age, affecting skin folds under armpits and breasts, responded well to treatment. Relapsed during current hospitalisation.
- No known history of allergy or intolerance to medications or food substances

C.2.3 Medications

Medicine	Dosage
Triphasil, 28	1 daily
Panadeine tablet	2 four times daily PRN for headache
Diprosone OV 0.05% cream	topical application to affected areas

C.2.4 Discharge plan

- Discharge medications: Nexium Hp7 for H. Pylori eradication; Diprosone cream.
- Gastroenterologist follow-up in 4 weeks.
- Discharge summary to GP with recommendations on follow-up oral esomeprazole therapy.

C.2.5 Discharge medications (prescription)

- Nexium Hp7, 1 pack, composite pack, Dose: for 7 days.
- Diprosone OV 0.05% ointment, 30 g, tube. Dose: topical application to affected areas once a day.

C.3 Scenario 3: Dispensing in detail

C.3.1 Clinical story 3 – dispensing scenario

- Ms Sabrina Carver visits her local pharmacy to have the prescription items dispensed. On arrival a shop assistant receives the prescription and determines what items are to be dispensed. In this case all items on the prescription are to be dispensed. She is also asked if a cheaper brand can be dispensed if available. The patient agrees that this can be done. An identification slip is given to the patient.
- The prescription is initially reviewed by the pharmacist to ensure that it is complete, that it complies with legal and PBS requirements, and is clear and understandable.
- The pharmacist retrieves the patient's electronic record with details of the past dispensing history. The pharmacist checks to ensure that the correct patient record has been selected. An initial scan of the prescription items is performed and compared to the existing dispensing record to determine if there is consistency or that changes are reasonable. Obvious drug interactions are also identified. Other checks include:
  - existing drug allergies,
  - multiple items from the same therapeutic class,
  - dose and directions,
  - potential contra-indications and
  - age implication.
- Relevant precautions are also identified. Any issues requiring clarification or potential alteration are followed up with the prescriber.
- Each prescription items is then entered into the computer system.

C.3.1.1 Item 1: Nexium Hp7

(See Appendix C.2.5 for a summary of the prescription in this scenario.)

Prescription item:

- Nexium Hp7, 1 pack for 7 days

Search criterion: 'Nexium Hp7'

The following matches based on the TPP are displayed:

- Nexium Hp7, 1 pack

This is selected and the followed TPP is displayed and has PBS code 8738X.

Nexium Hp7 is a multi-component pack and contains the following items (TPPs), which the dispensing application identifies:

- Amoxil 500 mg capsule, 28
- Klacid 500 mg tablet, 14
- Nexium 20 mg tablet: enteric, 14

Directions entered:

- Pack: To be taken as directed on each pack for 7 days.
  - Amoxil 500 mg: Take TWO capsules twice a day for 7 days until finished.
  - Klacid 500 mg: Take ONE tablet twice a day for 7 days until finished
  - Nexium 20 mg: Swallow ONE tablet whole twice a day for 7 days until finished.
- Quantity: 1 pack
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Klacid Label 5 -	Ask your doctor or pharmacist before using any other medicine including over-the-counter medicines or health products.
Nexium Label A -	SWALLOW WHOLE Do not crush or chew

The prescription labels and Consumer Medication Information are printed.

Nexium Hp7, 1 pack

Take as directed on each inner pack for 7 days.

Ms Sabrina Carver 0 Rpt

19/11/12 Dr Scoby $35.40

Amoxil 500 mg capsule, 28

Take TWO capsules twice a day for 7 days until finished.

Ms Sabrina Carver 0 Rpt

19/11/12 Dr Scoby

Klacid 500 mg tablets, 14

Take ONE tablet twice a daily for 7 days until finished.

Ms Sabrina Carver 0 Rpt

19/11/12 Dr Scoby

```
Nexium 20 mg tablet: enteric, 14

Swallow ONE tablet whole twice a
day for 7 days until finished.

Ms Sabrina Carver            0 Rpt
19/11/12   Dr Scoby
```

C.3.1.2 Item 2: Diprosone

(See Appendix C.2.5 for a summary of the prescription in this scenario.)

Prescription item:

- Diprosone OV 0.05% (500 microgram/g) cream, 30 g, topical application to affected areas

Search criterion: 'Diprosone OV'.

The following matches based on the TPP are displayed:

- Diprosone OV 0.05% cream, 5 g
- Diprosone OV 0.05% cream, 30 g
- Diprosone OV 0.05% ointment, 5 g
- Diprosone OV 0.05% ointment, 30 g

'Diprosone OV 0.05% cream, 30g' is selected for dispensing.

Directions entered:

- Apply a thin film once a day as directed to affected areas.
- Quantity: 30 g
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

```
Diprosone OV 0.05% cream, 30g

Apply a thin film once a day as
directed to affected areas.

Ms Sabrina Carver          0 Rpt

19/11/12   Dr Scoby
```

As with Clinical Stories 1 and 2, the dispensed items are scanned and matched to the prescription. The patient is counselled regarding the use of Nexium Hp7 and Diprosone OV cream.

Appendix D Clinical scenario 4

D.1 Clinical narrative overview

D.1.1 Prescription processes narrative including use of the AMT

- A GP is requested by a nursing home staff nurse to review a 75 year old patient with worsening signs and symptoms of inflammation of left leg. The patient has developed chills, rigors and become increasingly lethargic with mild confusion.
- Clinical examination confirms that the patient suffers from severe cellulitis of left leg and blood test results confirm bacteraemia.
- After the clinical review, the GP prescribes IV Ceftriaxone 12 hourly.
- The nurse also requested the GP to write prescriptions for resupply of the following long term medications for this patient:
  - Marevan 7 mg, daily at 4:00pm (target INR 2.0 – 3.0)
  - Timoptol eye drops 0.5% solution, one drop in affected (right) eye twice a day
  - Caltrate with Vitamin D 600 mg/400IU, one tablet daily
- As winter flu season is approaching in a few weeks, the GP decides to prescribe pre-winter flu vaccination in accordance to established standing vaccination plan.
- The nursing home prescribing software has built in decision support function.
- The prescribing software provides search function on AMT MPUU, MPP, TPUU, TPP and CTPP medication products using brand and active ingredient names.
- The decision support application uses AMT concepts and its drug knowledgebase to check for drug-drug interactions, contra-indications including allergies or intolerances, and daily dose threshold for this patient. The decision support application does not detect any drug-drug interactions or contra-indications.
- The decision support application identifies patient's childhood allergy history to egg/egg products and raises drug-condition reaction alert. GP overrides the alert and progresses with prescription. The override decision is based on:
  - latest guidelines on vaccinating people with egg allergy (http://www.cdc.gov/flu/professionals/vaccination/vax-summary.htm); and
  - patient received flu vaccination in previous years without any adverse reactions.

D.1.2 Dispensing overview

- The patient's nursing home arranges for the prescription to be delivered to the local pharmacy to have the prescription items dispensed. Based on instructions from the nurse, the shop assistant receives the prescription and determines what items are to be dispensed. In this case all items on the prescription are to be dispensed. No consent is available to dispense alternate brands.
- The prescription is initially reviewed by the pharmacist to ensure that it is complete, that it complies with legal and PBS requirements, and is clear and understandable.
- The pharmacist retrieves the patient's electronic record with details of the past dispensing history. The pharmacist checks to ensure that the correct patient record has been selected. An initial scan of the prescription items is performed and compared to the existing dispensing record to determine if there is consistency or that changes are reasonable. Obvious drug interactions are also identified. Other checks include – existing drug allergies, multiple items from the same therapeutic class, dose and directions, potential contra-indications and age implication. Relevant precautions are also identified. Any issues requiring clarification or potential alteration are followed up with the prescriber.
- Each prescription item is then entered into the computer system.
- Each medication is entered as a search criterion, a match found and selected. Alerts are checked, items are accepted for dispensing and labels generated and printed.
- Items are dispensed.

D.2 Scenario 4: Prescribing in detail

D.2.1 Event / encounter Trigger

- A 75-year-old male nursing home resident, David Swain, is reviewed by his GP for cellulitis of his left leg. The cellulitis started about 1.5 weeks ago and worsens progressively despite the oral antibiotics he was put on 5 days before this review. The GP ordered blood culture 5 days ago and repeated FBE, U&E the day before this review.
- The GP also discusses with the patient about pre-winter flu vaccination. Patient agrees to vaccination.
- The nurse also requests new prescriptions for caltrate with vitamin D, warfarin and timoptol eye drops (medications run out in few days).

D.2.2 Medical history

- Atrial Fibrillation (diagnosed at age of 67 years of age)
- Hypertension (diagnosed at age of 55)
- Ischaemic Heart Disease (diagnosed at age of 59)
- Glaucoma, right eye (diagnosed 6 months ago)
- Mild benign hypertrophy of prostate (diagnosed at age of 66)

D.2.3 Medications

Medicine	Dosage
digoxin 62.5 microgram tablet	once daily in morning
Lasix 40 mg tablet	80 mg in morning and 40 mg in mid-day
metoprolol tartrate 50 mg tablet	once daily in morning
Marevan 1 mg tablet	7 mg, daily at 4:00pm (target INR 2.0 – 3.0)
Marevan 5 mg tablet	As above
Timoptol 0.5% eye drops	one drop in affected (right) eye twice daily
Caltrate with Vitamin D 600 mg/400 units tablet	one tablet daily in morning

D.2.4 Allergy/intolerance

- Mild allergy to egg reported when in childhood. Consumption of egg products on a few occasions in childhood resulted in hives. Patient avoided egg products since.
- No other known allergy/intolerance.

D.2.5 On examination

- Lethargic, mild confusion
- Respiratory rate = 16-18/min, no dyspnoea, SaO2 (pulse oximetry) = 95% on room air
- Left leg: erythematous, shiny skin from dorsum of foot to mid-calf, very warm to touch, painful (pain scale = 6-8/10)
- Heart rate = 106/min
- Body temperature: 40.2C, chills, rigors
- Blood Results: leucocytosis with neutrophilia; while blood culture generally produces low yield in cellulitis (positive in 5-15% of cases), the test report for this patient identifies growth of streptococcus pyogenes colonies in culture with susceptibility to Ceftriaxone.
- Ultrasonography of affected foot and leg showed no occult abscess

D.2.6 Management plan

- Manage cellulitis and bacteraemia with ceftriaxone
- Reassess in 2 days
- Order flu vaccine for vaccination after current episode of cellulitis and bacteraemia
- Prescriptions for Caltrate with Vitamin D, Marevan and Timoptol eye drops

D.2.7 Prescription

- Ceftriaxone 1 g injection, 5 x 1 g vials Dose: 1 g, IVI 12 hourly
- Marevan 1 mg tablets, 50 bottle x 1, Dose: 7 mg orally, daily at 16:00 hours
- Marevan 5 mg tablets, 50 bottle x 1, Dose: 7 mg orally, daily at 16:00 hours
- Timoptol 0.5% eye drops, 1x bottle, Dose: 1 drop in right eye, twice daily
- Caltrate with Vitamin D 600 mg/400 IU tablet, 60, bottle. Dose: one tablet daily in morning
- Fluarix 2012 injection, 1 x 0.5 mL syringe. Dose 0.5 mL IM (to be administered by GP after current cellulitis and bacteraemia episode)

D.3 Scenario 4: Dispensing in detail

D.3.1 Clinical Story 4 – dispensing scenario

- The patient's nursing home arranges for the prescription to be delivered to the local pharmacy to have the prescription items dispensed. Based on instructions from the nurse, the shop assistant receives the prescription and determines what items are to be dispensed. In this case all items on the prescription are to be dispensed. No consent is available to dispense alternate brands.
- The prescription is initially reviewed by the pharmacist to ensure that it is complete, that it complies with legal and PBS requirements, and is clear and understandable.
- The pharmacist retrieves the patient's electronic record with details of the past dispensing history. The pharmacist checks to ensure that the correct patient record has been selected. An initial scan of the prescription items is performed and compared to the existing dispensing record to determine if there is consistency or that changes are reasonable. Obvious drug interactions are also identified. Other checks include:
  - existing drug allergies,
  - multiple items from the same therapeutic class,
  - dose and directions,
  - potential contra-indications and
  - age implication.
- Relevant precautions are also identified. Any issues requiring clarification or potential alteration are followed up with the prescriber.
- Each prescription item is then entered into the computer system.

D.3.1.1 Item 1: Ceftriaxone

(See Appendix D.2.7 for a summary of the prescription in this scenario.)

Prescription item:

- Ceftriaxone 1 g injection, 5 x 1 g vials, Dose: 1 g, IVI 12 hourly

Assumption: the nursing home has stocks of water for injection ampoules.

Search criterion: 'ceftriaxone 1 g'

The following matches based on the MPP are displayed:

- ceftriaxone 1 g injection, 1 x 1 g vial
- ceftriaxone 1 g injection, 5 x 1 g vials
- ceftriaxone 1 g injection, 10 x 1 g vials

The pack of ceftriaxone 1 g injection, 10 x 1 g vials is selected. This then displays the available TPPs for dispensing:

- Ceftriaxone (AFT) 1 g injection: powder for, 1 x 1 g vial
- Ceftriaxone (DBL) 1 g injection: powder for, 1 x 1 g vial
- Ceftriaxone (ICP) 1 g injection: powder for, 1 x 1 g vial
- Ceftriaxone (Sandoz) 1 g injection: powder for, 1 x 1 g vial
- Rocephin 1 g injection: powder for, 1 x 1 g vial

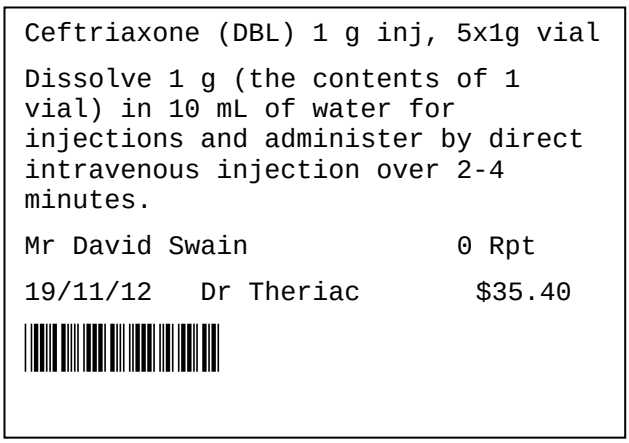
'Ceftriaxone (DBL) 1 g injection: powder for, 1 x 1 g vial' is then selected for dispensing. This has the PBS code 1748X.

Directions entered:

- Dissolve 1 g (the contents of 1 vial) in 10 mL of water for injections and administer by direct intravenous injection over 2-4 minutes.
- Quantity: 5 x 1 g vials
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

The dispensing label and Consumer Medication Information are then printed. (The label assumes that when 5 individual vials are supplied the label will appear as 5 x 1 g vials, even though the TPP refers to a pack of 1 vial. This is another case where the label name has been shortened.)



D.3.1.2 Item 2: Marevan

(See Appendix D.2.7 for a summary of the prescription in this scenario.)

Prescription item:

- Marevan 1 mg tablets, 50 bottle x 1, Dose: 7 mg orally, daily at 16:00 hours
- Marevan 5 mg tablets, 50 bottle x 1, Dose: 7 mg orally, daily at 16:00 hours

Assumption: patient is having regular INR (International Normalised Ratio) tests to determine warfarin dose.

This is also an example of a product where the brand is not changed, i.e. the two marketed brands are not considered bioequivalent and therefor interchangeable.

Search criterion: 'Marevan'.

The following matches based on the TPP are displayed:

- Marevan 1 mg tablet: uncoated, 50 tablets
- Marevan 3 mg tablet: uncoated, 50 tablets
- Marevan 5 mg tablet: uncoated, 50 tablets

The Marevan 1 mg is selected for dispensing, PBS code 2843P.

Directions entered:

- Take TWO tablets daily at 4 pm or as directed based on blood tests.
- Quantity: 50
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Search criterion: 'Marevan'

The following matches based on the TPP are displayed:

- Marevan 1 mg tablet: uncoated, 50 tablets
- Marevan 3 mg tablet: uncoated, 50 tablets
- Marevan 5 mg tablet: uncoated, 50 tablets

'Marevan 5 mg' is selected for dispensing, PBS code 2211J.

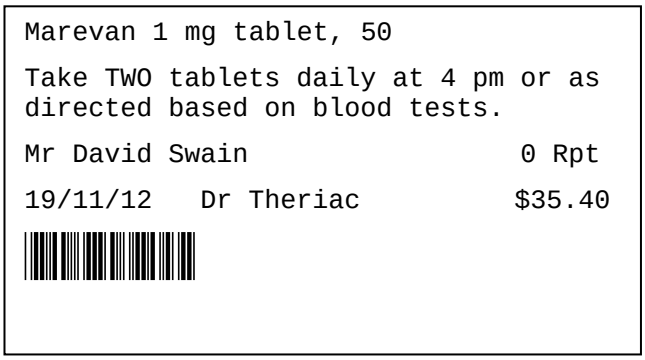
Directions entered:

- Take ONE tablet daily at 4 pm or as directed based on blood tests.
- Quantity: 50
- Repeats: 0

Marevan 1 mg and Marevan 5 mg:

Label 5 -	Ask your doctor or pharmacist before using any other medicine including over-the-counter medicines or health products.
Label 10b -	DO NOT TAKE ASPIRIN while being treated with this medicine unless advised by your doctor.

The dispensing label and Consumer Medication Information are then printed.



```
Marevan 5 mg tablet, 50

Take ONE tablet daily at 4 pm or as
directed based on blood tests.

Mr David Swain                  0 Rpt

19/11/12   Dr Theriac          $35.40
```

D.3.1.3 Item 3: Timoptol

(See Appendix D.2.7 for a summary of the prescription in this scenario.)

Prescription item:

- Timoptol 0.5% eye drops, 1x bottle, Dose: 1 drop in right eye, twice daily.

Search criterion: 'Timoptol'

The following matches based on the MPP are displayed:

- Timoptol 0.25% eye drops: solution, 5 mL
- Timoptol 0.5% eye drops: solution, 5 mL

The dispensing application also displays an alternative brand to allow a cheaper option to be selected if available:

- Tenopt 0.25% eye drops: solution, 5 mL
- Tenopt 0.5% eye drops: solution, 5 mL

In this case Timoptol 0.5% eye drops are selected for dispensing, PBS code 1279H

Directions entered:

- Instil ONE drop in the right eye twice a day.
- Quantity: 1 x 5 mL bottle
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label 7b - Discard 28 days after opening.
Date opened: __/__/__

```
Timoptol 0.5% eye drops, 5 mL


Instil ONE drop in the right eye
twice a day.

Mr David Swain                  0 Rpt

19/11/12   Dr Theriac         $20.59
```

D.3.1.4 Item 4: Caltrate with Vitamin D

(See Appendix D.2.7 for a summary of the prescription in this scenario.)

Prescription item:

- Caltrate with Vitamin D 600 mg/400 unit, 60 bottle x 1, one tablet daily in morning

Search criterion: 'Caltrate with Vitamin D'

The following matches based on the TPP are displayed:

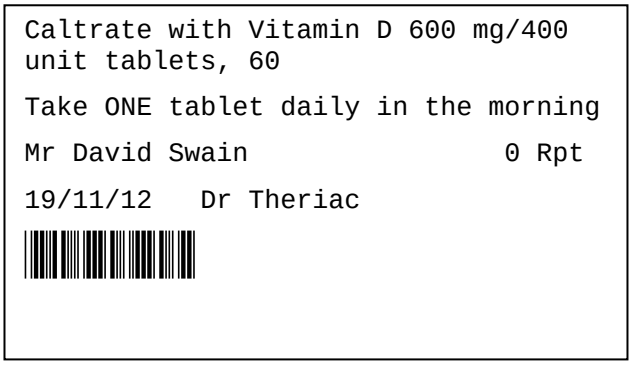
- Caltrate with Vitamin D 600 mg/400 units tablet, 60
- Caltrate with Vitamin D 600 mg/400 units tablet, 100
- Caltrate with Vitamin D 600 mg/400 units tablet, 120

In this case Caltrate with Vitamin D 600 mg/400 units tablet, 60 is selected for dispensing.

Directions entered:

- Take ONE tablet daily in the morning.
- Quantity: 60
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.



D.3.1.5 Item 5: Fluarix

(See Appendix D.2.7 for a summary of the prescription in this scenario.)

Prescription item:

- Fluarix 2012, 1 x 0.5 mL syringe. Dose 0.5 mL IM (to be administered by GP after current cellulitis and bacteraemia episode)

Search criterion: 'Fluarix'

The following matches based on the TPP are displayed:

- Fluarix 2012 injection: suspension, 1 x 0.5 mL syringe

Note: Only the vaccine for the current year is displayed.

'Fluarix 2012' is selected for dispensing.

Directions entered:

- Inject 0.5 mL by intramuscular injection.
- Quantity: 1
- Repeats: 0

No alerts are displayed and the item is accepted for dispensing and inclusion in the patient's medication dispensing record.

Label - Refrigerate
Do not freeze

```
Fluarix 2012 injection, 1 x 0.5 mL
syringe

 Inject 0.5 mL by intramuscular
injection.

Mr David Swain                0 Rpt

19/11/12   Dr Theriac
```

As with Clinical Stories 1, 2 and 3, the dispensed items are scanned and matched to the prescription. Arrangements are made to counsel the patient and ensure that instructions for the use of ceftriaxone, Fluarix as well as warfarin are clear.

Appendix E Glossary

Acronym	Term	Notes
AMT	**Australian Medicines Terminology**	
APF	**Australian Pharmaceutical Formulary**	
ARTG	**Australian Register of Therapeutic Goods**	
BoSS	**Basis of Strength Substance**	
BMI	**Body Mass Index**	
COTS	**Commercial Off the Shelf**	
CTPP	**Containered Trade Product Pack**	A component of the AMT's ontology.
DVA	**Department of Veterans' Affairs**	
DM	**Diabetes Mellitus**	
DMAR	**Disease Modifying Anti-Rheumatoid arthritis drug**	
EMR	**Electronic Medical Record**	This phrase is used generically in this document to refer to any electronic implementation of a medical record.
ERRCD	**Electronic Recording and Reporting of Controlled Drugs**	
ETP	**Electronic Transfer of Prescriptions**	
FSN	**Fully Specified Name**	
GI	**Gastrointestinal**	
GORD	**Gastro-Oesophageal Reflux Disease**	
GP	**General Practitioner**	
GTIN	**Global Trade Item Number**	An identifier for trade items, often represented by a bar code on a product.
IHTSDO	**International Health Terminology Standards Development Organisation**	

Acronym	Term	Notes
INR	**International Normalised Ratio**	
IU	**International Unit**	
IM	**Intramuscular**	
IVI	**Intravenous Injection**	
MP	**Medicinal Product**	A component of the AMT's ontology.
MPP	**Medicinal Product Pack**	A component of the AMT's ontology.
MPUU	**Medicinal Product Unit of Use**	A component of the AMT's ontology.
NCTIS	**National Clinical Terminology and Information Service**	
NPDR	**National Prescribing and Dispensing Repository**	
NSAID	**Non-Steroidal Anti-Inflammatory Drug**	
OGD	**Oesophago-Gastro-Duodenoscopy**	Endoscopy of the upper gastrointestinal tract.
OTC	**Over the counter**	
PCEHR	**Personally Controlled Electronic Health Record**	The official Australian government eHealth record.
PBS	**Pharmaceutical Benefits Scheme**	
POS	**Point of Sale**	
PT	**Preferred Term**	
PES	**Prescription Exchange Service**	
PRN	**Pro re nata**	A Latin phrase commonly used in medicine to mean 'as needed'.
PPI	**Proton Pump Inhibitor**	
RPBS	**Repatriation Pharmaceutical Benefits Scheme**	
RA	**Rheumatoid arthritis**	
SNOMED CT-AU	**SNOMED CT, Australian Release**	Australian extension to SNOMED CT.

Acronym	Term	Notes
SNOMED CT	**Systematized Nomenclature of Medicine, Clinical Terms**	
AUST L	**TGA listed item**	
AUST R	**TGA registered item**	
TGA	**Therapeutic Goods Administration**	
TP	**Trade Product**	A component of the AMT's ontology.
TPP	**Trade Product Pack**	A component of the AMT's ontology.
TPUU	**Trade Product Unit of Use**	A component of the AMT's ontology.