nehta

Mapping guidelines

Australian Medicines Terminology

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National E-Health Transition Authority

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Quality reviews

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001	----	Technical writer	Editorial review	To bring the document formatting and content into alignment with NEHTA's editorial standards.

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1 Introduction

1.1 Purpose

This document describes a mapping methodology that should be followed when mapping local and proprietary medicine coding systems to the Australian Medicines Terminology (AMT).

The key purpose of this document is to provide guidelines for mapping existing coding systems to the AMT to assist vendors and healthcare providers in their implementation.

1.2 Intended audience

The intended audience includes:

- Health software vendors and vendors of proprietary health terminology products.
- Health jurisdictions and healthcare providers who develop their own maps, or outsource the mapping to vendors.
- Compliance assessors who perform conformity assessment of AMT mapping implementations.
- Terminology and classification communities.

1.3 Scope

This document provides guidance for those AMT mapping projects to be undertaken as part of eHealth Sites and Personally Controlled Electronic Health Records (PCEHR) programmes, but may also be useful to those developing maps for other purposes. Users outside these programmes who wish to implement AMT via mapping may also use this document to assist in their implementations.

1.4 Overview

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 all commonly used medicines in Australia and can be implemented in clinical information systems for the following activities – prescribe, record, review, issue including dispense, administer and transfer of information [NEHTA2011e].

A requirement to use the AMT to describe medicines in eHealth messages is included in relevant eHealth message specifications published by NEHTA and in national health messaging standards, including:

- Electronic Prescription;
- Prescription Request;
- Dispense Record;
- Referral;
- Specialist Letter;
- Discharge Summary; and

- Shared Health Summary.

The AMT is consequently one of the key foundations for PCEHRs [DOHA2011a].

The AMT may also be used for purposes other than eHealth messaging and system interoperability. However these purposes are beyond the intended scope of the AMT maps for eHealth Sites and PCEHR, and are out of scope for this document.

Users intending to use the AMT for secondary purposes such as research and statistical reporting should contact the National Clinical Terminology and Information Service (NCTIS) for specific implementation guidance.

2 Implementing AMT

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 AMT:

A: **Mapping of AMT to an existing local medicine list.** This requires the organisation to complete the initial mapping exercise and manage the maintenance activities associated with subsequent AMT releases. The user interacts with the local medicine list through the user interface; local terms are recorded in the health record and mapped to AMT terms for the purpose of transferring information externally in system-to-system messages.

B: **Replace the current local medicine list** with a Commercial Off the Shelf (COTS) medicine dictionary product that has been mapped to AMT. The mapping and maintenance activities of this option are undertaken by the vendor of the COTS medicine dictionary. The user interacts with the COTS medicine list through the user interface; COTS terms are recorded in the health record and mapped to AMT terms for the purpose of transferring information externally in system-to-system messages.

C: **Native implementation of AMT.** The healthcare application in this option uses AMT in its native form (this could be absorbed by the application or accessed via a COTS medicine dictionary), the distinction in this option is that users of the application are interacting with AMT concepts through the user interface and AMT concepts are stored and shared throughout the system. The COTS medicine dictionary is still required alongside AMT to provide certain resources and functions.

These options are illustrated below.

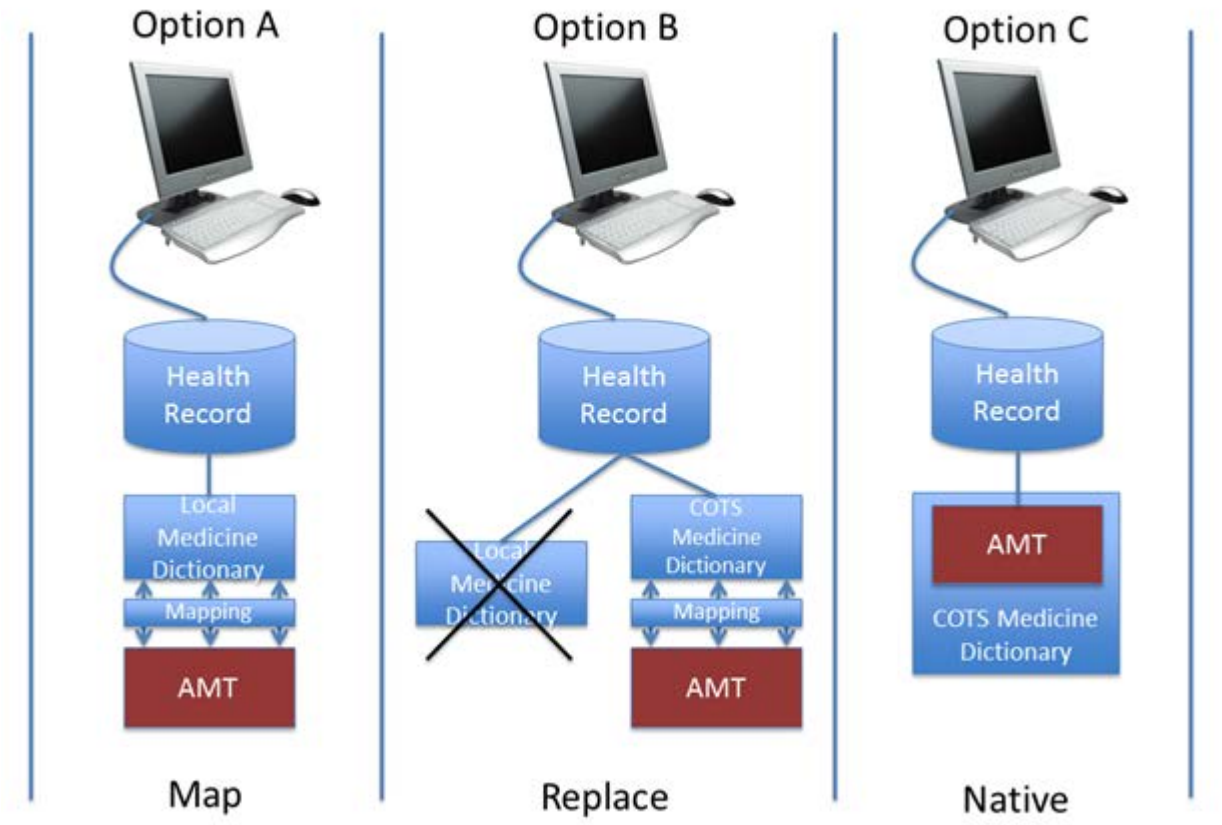

Figure 1: AMT implementation options

This document contains guiding principles to assist the developer of AMT maps. Although the document has been developed with the current AMT model (v2) and components in consideration, the principles and guidelines should be applicable to future versions of the AMT. However, NEHTA may update this document when a future version with the modified model and components is released.

2.1 Licence agreements

All parties who download and use the AMT are required to agree to the SNOMED CT Affiliate Licence Agreement [IHTSDO2009b] and Australian National Terminology Release Licence Agreement [NEHTA2009a]. When the 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. All developers of the maps, therefore, are required to review and understand these licence terms.

2.2 What is a map?

A map is an index from one code and/or term to another. Rules may sometimes be used to allow translation from one representation to another indicating degree of equivalence. A map is often computable and it is the outcome of the mapping process [ISOTC215a].

Individual maps are collected in a map table which contains all the individual map entries for a given code set required for a specific purpose.

The process of mapping is a process of defining a relationship between a code from the local/proprietary code system to a concept in the AMT according to a documented rationale or methodology for a defined purpose.

The process of mapping produces individual map entries: an individual row in a map table which shows the original local/proprietary code value and the equivalent value in the AMT. Each individual map entry may be used to automate conversion of information from the original code value to the AMT code value, or from the AMT code to the original code value (if the map has been built to map in both directions). These entries are held in two map tables – a build table and the AMT map.

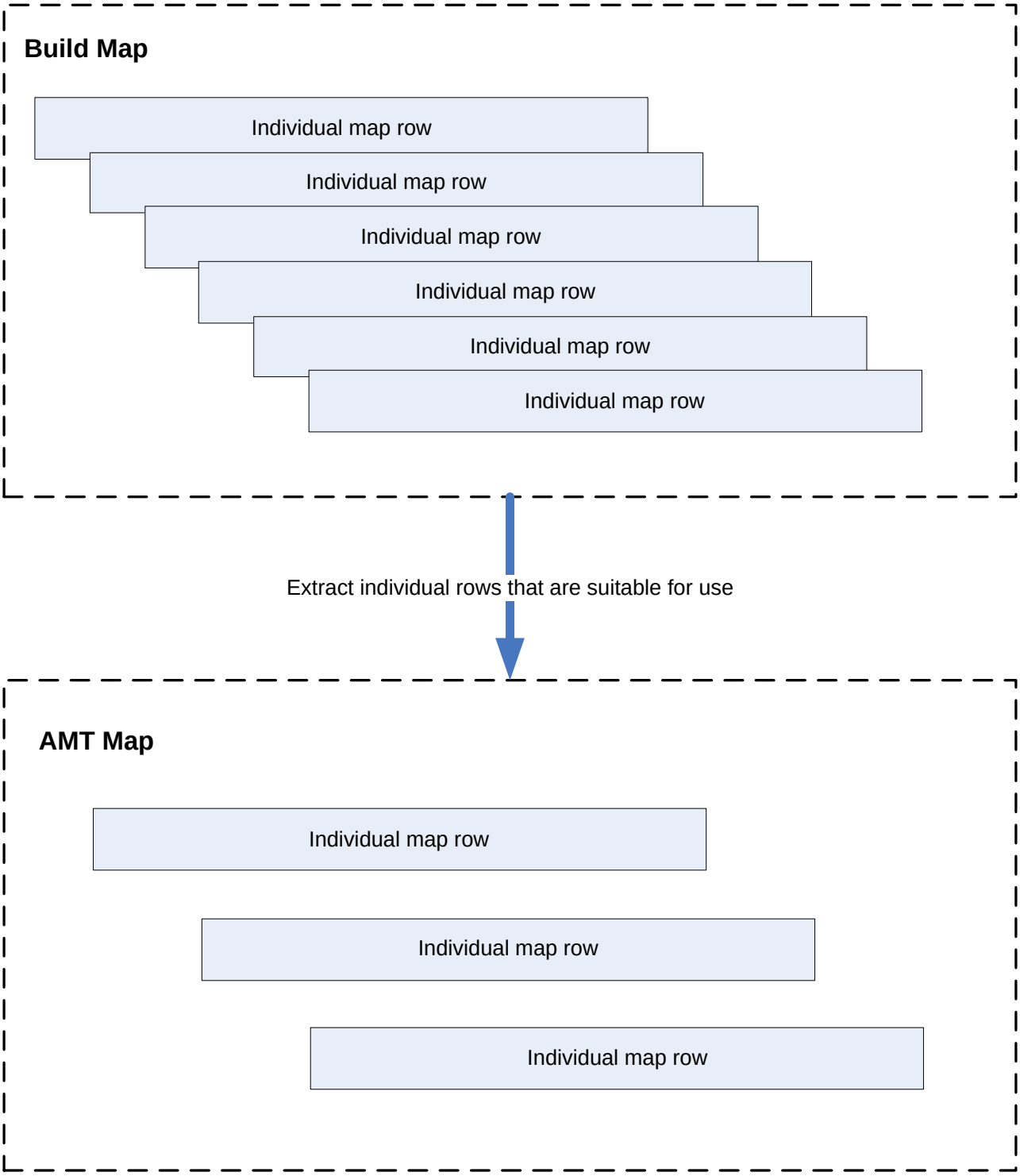

Figure 2: Map tables and components

The build map is a table of all the individual map entries used to manage the mapping process by progressively building individual maps. It also contains details of the status of each individual map, the issues related to each entry, and the resolution of the issue.

The AMT map is an extract of the build map. It holds each source concept ID and description (from the local/proprietary system) and the AMT (target) concept ID and description to which it equates. This is a subset of the information held in the build map.

The mapping process must also produce a mapping methodology document which identifies the purpose and processes used to develop the map.

3 Mapping methodology

The AMT map is a table or computable representation of each source concept ID and description (from the local/proprietary system) and the AMT (target) concept ID and description to which it equates.

The development and maintenance of an AMT map requires commitment of resources, use of tools, documentation and consistent and repeatable steps. Each of these requirements is clarified in this section and guidance provided on how to progress each process to a suitable quality.

3.1 Development of the methodology

This mapping methodology has been developed based on:

- Draft or published standards, guidelines and reports on mapping of health terminologies by standards organisation such as International Health Terminology Standards Development Organisation (IHTSDO), International Organization for Standardization (ISO) and Standards Australia ;
- Lessons learnt from projects to map to the AMT in Australia and also international terminology mapping projects;
- Clinical safety risks assessment and requirements for the AMT;
- AMT technical specifications, editorial rules and release notes; and
- NEHTA eHealth messaging specifications.

3.2 Benefits of the methodology

Sound mapping practices benefit all users of the map, and ensure that the data produced as a result of the map can be consistently and reliably used by the receivers of the information. Specific reasons for investing in sound mapping processes include:

- Maintenance of meaning (and thereby utility and clinical safety) of the information in the source and target systems.
- The ability to re-use and apply ongoing improvement to the map – thereby reducing the cost of map maintenance.

The methodology outlined in this document serves the purpose of providing a repeatable quality process to guide production and reproduction of maps. If followed, it will produce an AMT map that is safe and fit for use to support information exchange between healthcare systems. The methodology has been designed to meet NEHTA mapping quality assessment requirements and supports conformance as well as clinical safety.

A map which supports the ongoing translation of local code systems to the AMT for use in information exchange, is not used once, but is used repeatedly each time data is shared or reported. The map must be maintained and updated each time either the local/proprietary code system (source) or the AMT (target) is changed.

It is essential that the AMT map creation process be documented, repeatable and applied consistently throughout the life of the map. This includes decisions on mapping a specific type of concept in a specific way and resolution of issues.

Example:

Local code system:	Lamivudine 10 mg/ml oral solution
AMT:	lamivudine 10 mg/1 mL oral liquid, 1 mL measure (medicinal product unit of use)

Each of the medications is described with a different word to indicate dose form (oral solution vs. oral liquid).

In creating a map from the local system to the AMT, a decision might be documented (following analysis of the two data sets) to accept the term 'oral solution' in the local system as equivalent to the term oral liquid in the AMT.

Note: If the map is in the opposite direction, i.e. from the AMT to the local system, these terms may not be equivalent as an oral liquid may have more than one subform, e.g. oral suspension.

It is possible that in a future version of any map the decisions previously made may be changed. These changes must be clearly defined, documented and applied consistently throughout that version of the map, so that those using the resulting information can do so knowing what is intended to be included and the meaning implied. Users of the resultant data must be able to identify when the actual semantic meaning of the results of the map have changed.

For example: if a person were mapping medications with the term 'oral solution' in their local code system, they would know from the documentation that the term 'oral liquid' in the AMT may be deemed to be equivalent.

A map with appropriate documentation can reduce the ongoing maintenance costs. The documentation can also be used to induct new staff, and assist those who use the resultant information in understanding where information may have been modified or lost in the process of mapping.

Clinical systems apply the AMT map, i.e. automatically translate from the local/proprietary code system to the AMT for use in shared repositories (e.g. PCEHR) and for information exchange. It is therefore essential that the AMT map has a consistent structure and content, and quality approach to its development and maintenance to ensure that clinical software can safely use the AMT map and not misrepresent the shared information in clinical situations.

It is expected that those who prepare maps from local systems to the AMT will take all care to ensure clinical safety and conformance to the procedures described here.

3.3 The mapping process

The production of the map should include documentation of:

- The purpose of the map.
- Examples of scenarios which describe how the map is to be used.
- The map development process.
- Map team members and skills.
- Issues identified and decisions made.
- Format of the AMT map (published final map).
- Format of the build map (the version that includes all results of the mapping process, issues and status).
- Map maintenance timeframe.

There are alternative processes which may be used to produce a map. In the case of mapping to the AMT, Figure 3 indicates the mapping process considered to provide the minimum level of acceptable quality control. The following sections of this document describe this process in detail. Please note that the numbering of each step is indexical, as opposed to indicating the exact sequence of the process.

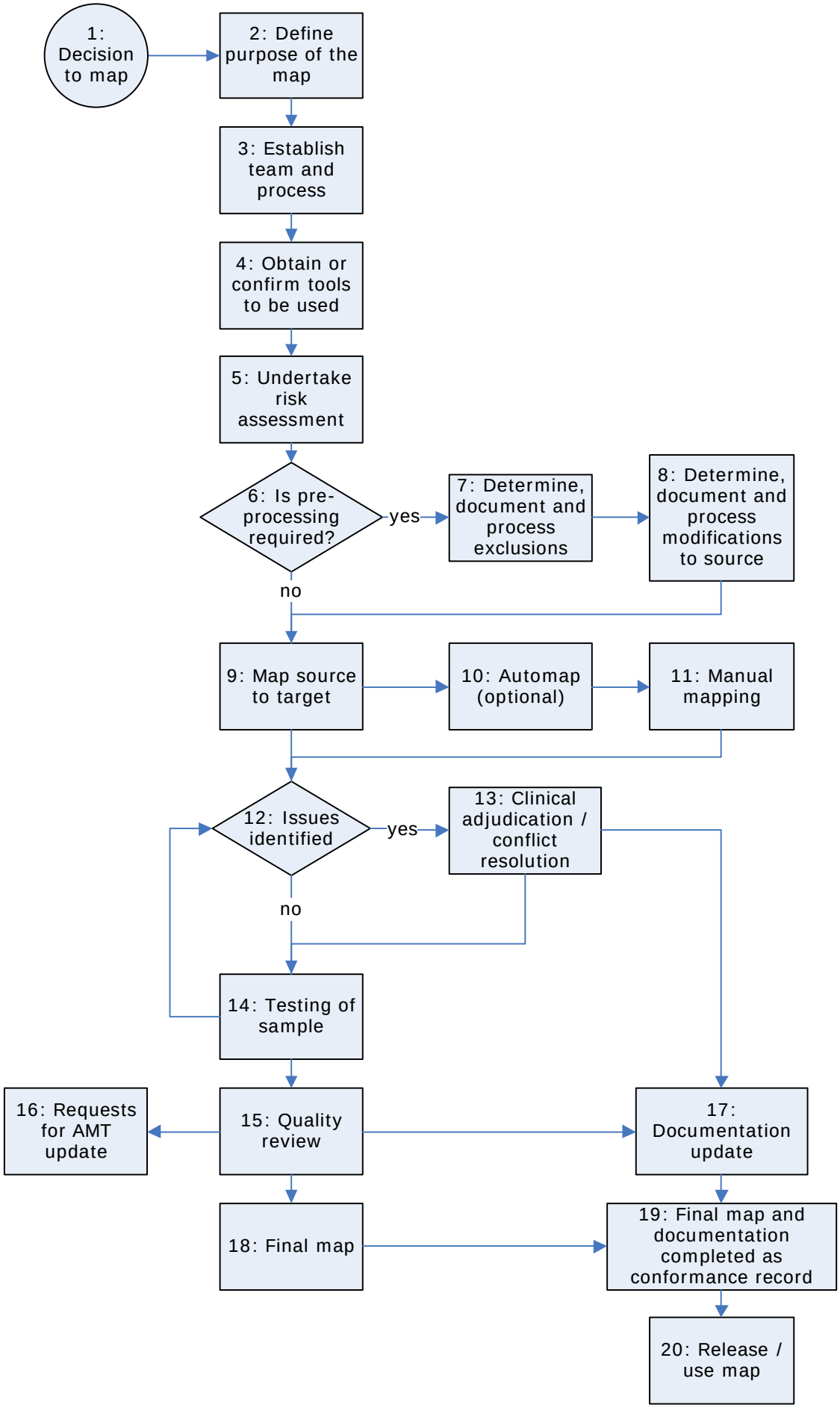

Figure 3: Outline of the mapping process

3.4 Step 1: Decision to map

Before a map is built or updated, it is necessary to undertake a review of whether to use a map or to convert existing local/proprietary data to the AMT. The ongoing costs associated with mapping are significant, and for this reason, it is envisaged that mapping will be seen as a mechanism to give vendors time and opportunity to transition to the use of the AMT within local systems and thereby removing the need to map.

There are effectively three choices in the use of the AMT, as described in Section 2.

1. Mapping of the AMT.
2. Replace the current local medicine list with COTS.
3. Native implementation of the AMT. This can be achieved in several ways:
    a. Single step

        The developer might undertake this change leaving the data from the old code system in historical records and simply use the AMT from a given start date. If the developer decides to convert historical data, this will require conversion of the data in the software system from a local/proprietary medication code and description to the AMT concept and description. This process is a once-only mapping process. The data is converted, stored, retrieved and represented using the AMT (plus any local concepts where required). This option may be the least expensive over time; however it may involve significant work for the software vendor as major changes may be required to database structures.

    b. Phased approach

        Use an AMT map as an interim solution with the plan to evaluate and at a later time natively implement the AMT within the software system. The mapping process can assist in defining the differences and gaps between the current local/proprietary code system and the AMT. This can assist in bridging those gaps between each system (through additions to the AMT where these are within scope) allowing eventual adoption of the AMT in the system and thereby removing the need and expense of map maintenance.

It is highly recommended that mapping of local/proprietary code sets to AMT should be considered as a short-term strategy leading to native implementations of AMT in user systems in the mid- to long-term. This will increase semantic interoperability and reduce maintenance burden for users.

3.5 Step 2: Define the purpose of the map

3.5.1 Statement of purpose of the map

A map must have a defined purpose. Maps should be built for a single purpose, as this purpose influences decisions made about how to map those concepts which do not have exact comparisons between the local/proprietary code system and the AMT.

Example:

If the map is to be used to support fiscal reporting using PBS the rules which apply to building the map might include some rules that relate to charging conditions or requirements. A map for clinical purposes would take into account the clinical needs of those who use the result of the map.

3.5.1.1 Purpose of local system map to the AMT

The map is being provided to support interoperability and sharing of healthcare information in a manner that is safe and provides consistent representation of medication information.

Within the documented methodology, the developer needs to clearly indicate the purpose of the map and to provide specific scenarios which describe the use. This forms the basis for further decision-making relating to the mapping process.

The following table provides an example of currently known use cases of maps from local code systems to the AMT. These purposes recognise that the AMT is primarily for prescribing, dispensing, recording, reviewing and administering medications.

Table 1: AMT map use definition

General use	Description	Comment (indicate the impact of this usage upon the map or the mapping process
Direct patient care (clinical use)	The AMT is primarily used to support prescribing, dispensing and administration of medications and unambiguously identifies medicines to clinicians at various levels of abstraction. A map used for this purpose must not change the meaning originally intended by the author of the information. This usage requires an exact semantic match between concepts.	This is a clinical use. It is therefore important that the map not change the meaning intended by the original author.
Sharing of information (Transfer)	The map is to be used when information is shared outside the originating system. Specific examples include the PCEHR and NEHTA e-health solutions work programme: • Medication information in the consolidated view of the Shared Health Summary and Event Summary • Discharge Summary • Referral • Specialist Letter • Electronic Transfer of Prescriptions, Dispense records, Prescription requests Each of these is an example of sharing of information with direct patient care implications (i.e. clinical use and therefore requires an exact semantic match when mapping).	The ability to transfer information consistently will support sharing between systems inside and outside of the organisation. Indicate the specific information sharing intended to be used in this map, through the scenarios of use.
Other – indicate	Indicate other intended purposes of the map.	

3.5.2 Scenarios of intended use

Scenarios should be used to explain the intended use of the map. Each specific business example of where the map could be used or how the map could be used must be described in the scenario. Refer to Section 5 for sample scenarios for each AMT concept level.

The example below shows where GP software is using a map from the local code to the AMT and a different map from the AMT to the local code system.

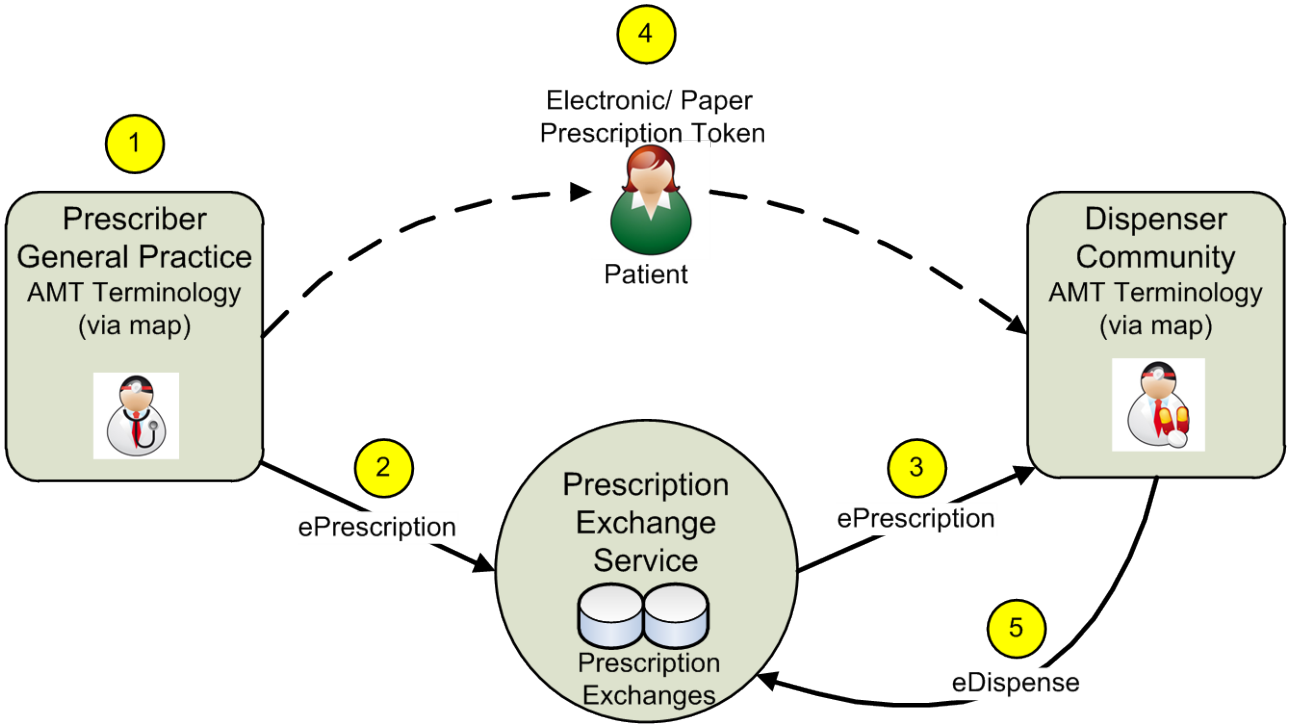

Figure 4: Example scenario of intended use of the map

1. A patient visits a GP who generates an ePrescription for a specific medicine via an electronic prescribing system. The GP selects the required medicine using the local code system description.
2. This medicine description is translated to the AMT term (via the map) for inclusion within the structured information of an electronic message sent to the prescription exchange service.
3. The electronic dispensing system receives the ePrescription via the prescription exchange service and uses the map to translate the AMT term into its local description.
4. The patient presents at a pharmacy with an electronic or paper prescription token. The pharmacist retrieves the ePrescription from the dispensing system and the medicine is then dispensed to the patient.
5. Upon the occurrence of the dispense event the electronic dispensing system generates an eDispense record which is sent to the prescription exchange service.

3.5.3 Audience

Indicate the intended users (decision makers, developers and users) of the data that will result from the map. The audience should be clear from the scenarios.

Examples:

- Clinicians in direct patient care (to support clinical practice).
- Software developers.
- Consumers of healthcare to support their care and decision making.

3.6 Step 3: Establish the team and processes

3.6.1 Define the scope of the map

Maps do not necessarily map every concept in the source to the target. A subset may be chosen for inclusion to meet the declared purpose.

The scope of the map has two elements:

1. The level at which to map.
2. Which content of the existing local/proprietary code system is to be included in the map.

Refer to the 'Statement of purpose' in the AMT Release Note [NEHTA2011e] for the content and coverage of AMT.

3.6.1.1 The level at which to map

The AMT has concepts at different levels of specificity. Each level has many attributes but all start from the perspective of a substance (or ingredient) from which the concepts are made. The structure of the AMT includes:

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

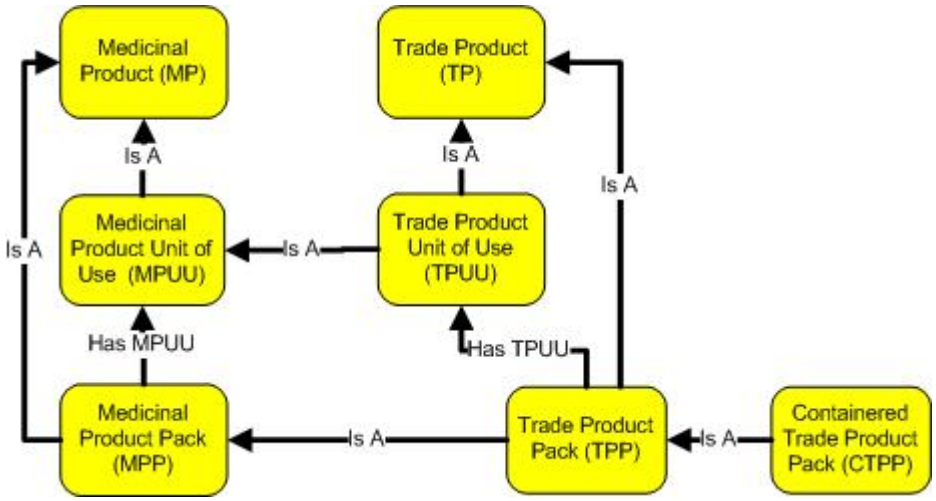

Figure 5: Relationships between AMT concepts in AMT Model (v2)

Maps to the AMT may be at one or more levels e.g. CTPP and TPP.

When deciding the level at which to map, consider the level at which the data in the local/proprietary code system is set and the purpose of the map.

In all cases the AMT concept that most closely matches the majority of current local/proprietary concepts is to be mapped. Where a local system uses a variety of concepts at different levels of specificity (as the AMT does) then a decision as to which concept(s) to map would need to be made.

Example:

If the local system uses trade names with marketed pack sizes (devoid of container type), then the Trade Product Pack (TPP), is the level at which the developer should map.

If the local system uses generic information (as most often occurs in hospital settings) the most likely level to map would be the Medicinal Product Unit of Use (MPUU) or Medicinal Product Pack (MPP), depending on the local system current requirement for pack size.

If the purpose of the map is for representation of medications for ICU, the content of the map may be limited to the range of drugs used in that specific environment

For prescribing and/or dispensing purposes it would not be appropriate to map only to a Medicinal Product or a Trade Product as the concept lacks the required specificity to accurately identify the medicine.

To be clinically relevant and safe for use the map should, wherever possible, be at the same level of granularity as the majority of information stored in the local/proprietary code system.

It is recommended that the developer first consider the representation from the lowest levels and move to higher levels only if it is not possible to map appropriately at the lower levels.

The following table indicates likely levels of concepts to be mapped (those indicated in the table may be used, provided they represent the level which is the minimal requirement). Refer to Section 6 for the attributes of each of the concept groups.

Table 2: AMT concept levels for mapping

AMT concept groups	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 Pack (CTPP)	✓	✓	✓	✓	
Substance		✓	✓		

If the intended use is to compose and send clinical documents as indicated in NEHTA specifications, the concept level(s) chosen to be mapped must conform to the AMT coding requirements of these clinical document specifications.

Example:

The *e-Prescription CDA Implementation Guide* [NEHTA2010a] includes the following requirements on the AMT concepts used to describe prescription items:

> "Prescription Item > Therapeutic Good Identification
>
> The set of values is Concept IDs and Preferred Terms from the AMT concepts which have one of the following modelled relationships:
>
> - IS A Medicinal Product Unit of Use (MPUU);
> - IS A Medicinal Product Pack (MPP);
> - IS A Trade Product Unit of Use (TPUU);
> - IS A Trade Product Pack (TPP);
> - IS A Containered Trade Product Pack (CTPP).
>
> Specifically for MPUU: only MPUU concepts that have no children MPUU are to be included. Where an MPUU concept is a parent of another MPUU, the parent MPUU is to be omitted." [NEHTA2010a] See also Section 7 for details.

Therefore, when mapping to the AMT for eHealth messaging, it is critical for the developer to review and understand how the AMT concepts are to be coded in clinical documents, thereby choosing the relevant AMT concept levels for mapping. NEHTA specifications for eHealth messages include Electronic Prescription, Prescription Request, Dispense Record, Referral, Specialist Letter, Discharge Summary and Shared Health Summary[1].

Document the level of detail in the local code system and the level of the AMT to which the map will be built.

3.6.1.2 How much of the code system should be mapped?

All content from the local/proprietary code system is initially considered for inclusion in the map table (as a build map). Only those individual maps with clinically safe semantic matches should be included in the final AMT map that is to be used by clinical systems for information exchange.

Figure 6 shows that there are two points at which inclusion in the map are considered. Firstly the pre-processing which removes concepts which are not appropriate to be mapped (including duplicates and historical concepts). The second is after the mapping build process where concepts have been assessed and determined whether each individual concept is able to be accurately mapped or not.

[1] See the various CDA implementation guides cited in Section 8.

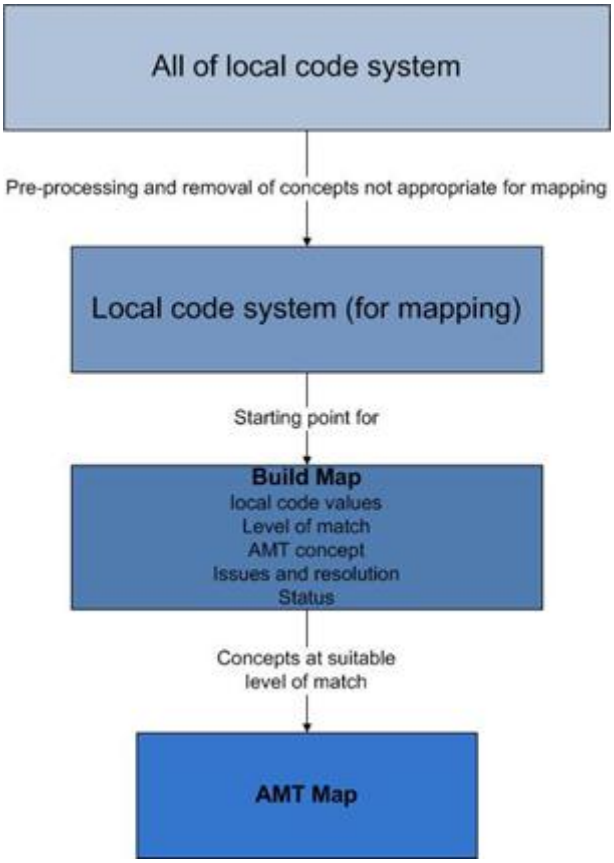

Figure 6: Reduction of concepts being mapped

There will be concepts in the local/proprietary code system which are not appropriate to be mapped and can either be removed from the build table or marked as 'not to be mapped' if they are kept in that table.

It is necessary to determine what will not be mapped in each individual map and to document these clearly.

Some of the source concepts which should not be mapped might include the following as they are deemed not in the current scope of the AMT:

- Duplicate entries.
- Locally manufactured products.
- Veterinary products.
- Pre-packs – such as those used in hospitals and emergency departments.
- Clinical trial drugs.
- Non-therapeutic products including food and devices (unless listed on the PBS).

In general only current active concepts are to be included in the map. The only exception to this would be conversion of historical data in the local system, where previously active concepts might be appropriate. Before determining to take this path, it is advisable to contact the NCTIS for specific advice.

A list of the total number of concepts, the number concepts in each exclusion type must be maintained for each version of the map. Table 3 (below) gives an example of such an exclusion table.

Table 3: Example of an exclusion table

Exclusion	Number of concepts
Total in original table at start	X
Discontinued and not used	X
Duplicate entries	X
Locally manufactured	X
Veterinary	X
Drugs in Clinical Trial	X
Pre-packs	X
Number to be removed	X
Remaining total	X

3.6.2 Structure of the map

The map format and structure will be dependent on:

- the structure of the source data – e.g. how pharmaceutical products are represented; and
- the format of the AMT at the level at which the map is built.

The map structure and technical format of the build and final AMT map should be clearly explained. For example the map might be built in Microsoft Excel®, and held in a SQL server database for secure use.

Table 4: Example explanation of a structure

Map Field	Description
Map ID	Unique identifier of each row entry in the map.
Source ID	The unique identifier (code) of the concept in the local/proprietary system.
Source Description	The full description used to represent the concept, as a clinician would view it.
Target concept ID	The unique AMT code (SctId) used to represent an individual AMT concept.
Target Description (AMT preferred term)	The preferred term is the AMT description that shall be included in the final AMT map along with the concept ID. This description may be of use in the build map for equivalence verification as it may contain an alternative description to the Fully Specified Name, however it may not be unique across the different hierarchies in AMT.
Target Description (AMT Fully Specified Name)	The Fully Specified Name includes the semantic tag at the end of the description, i.e. the part of the AMT hierarchy in which the concept sits. This description is unique across all hierarchies in the AMT and would normally be used during the mapping process, however it is not included in the final AMT map.
Additional fields	It may be appropriate to include additional fields of information from either the source or target code systems to assist with assessment of equivalence and verification of mapped item.

Map Field	Description
Match type	The codes used to describe the accuracy of the individual entry in the map (refer to Table 5).
Mapper	Identification of the mapping specialist who did the match. This field provides an audit trail if further explanation of any documented issues, or errors identified later in the verification process is required.
Status	Indicates whether the term is mapped (completed and agreed), referred for clinical adjudication, not to be mapped, or other status values that are helpful to the mapping process being used by the organisation.
Issue	This should outline any issues arising in completing the map including whether they are still open or resolved. For example items where clinical guidance is needed, or where it was not possible to find a match in the target AMT or a rule has been applied.

The concept of a 'match type' is introduced in Table 5. These relationships are based upon common definitions used in mapping SNOMED CT, but have been translated into non-specific terms which are more appropriate to this use case. The match type describes the relationship between the local/proprietary system concept and the AMT concept. The relationship indicates how accurate the match is and whether it is suited to clinical use.

Examples of different types of matches are also provided in Table 5. Lexical matches are those where the actual words in the description of each concept are exactly the same. Semantic matches are those where the meaning of the concept is the same even if the words are slightly different.

For clinical purposes, including mapping involving the AMT only match types 1, 2 or 3 are considered suitable for use. For this reason when the final AMT map is generated, matches of any other type should not be extracted from the build table. It is useful to retain the match level in the build table for consideration of requests to make additions to the AMT, or to assist in development of local system descriptions or code concepts. The build table is also useful when maintaining the map, requiring modifications and additions to be made only in the build table, from which the final map can be reproduced.

Table 5: Match type explanations and examples

Match types	Description of Level	Clinically Suitable	Example showing AMT Preferred Terms
1	Lexical and semantic match (same meaning and same words used)	Yes	Local code system: Alprazolam-DP 1mg Tablets, 50 AMT (trade product pack): Alprazolam-DP 1 mg tablet, 50
2	Semantic match, no lexical match, but words that are not misleading or confusing	Yes	Local code system: APO Pantoprazole 40mg Tablets, 30 AMT (trade product pack): Pantoprazole (Apotex) 40 mg tablet: enteric-coated, 30 tablets
3	Rules based Semantic Match, when rules are applied, there is no change of meaning	Yes	Local code system: Fluvax injection, 1 x 0.5 mL syringe AMT (trade product pack): Fluvax 2011 injection: suspension, 1 x 0.5 mL syringe
4	Semantic match, but no lexical match and words are confusing.	Poor	Local code system: acetaminophen AMT (medicinal product): paracetamol

Match types	Description of Level	Clinically Suitable	Example showing AMT Preferred Terms
5	Concept not present in the target	Not included in the map	Local code system: Aventis (Protamine 1%, 5 ml) Injection, 10
7	Concept is a subset of a single match in the target	Not included in the map	Local code system: diclofenac potassium AMT (medicinal product): diclofenac AMT (medicinal product): diclofenac If there are matches of this type, consideration of changing the level of the map should be given, or identification of computable rules should be introduced.
8	Concept partly matches a single or more than one concept in the target	Not included in the map	Local code system: Panadeine Forte AMT (trade product): Panadeine
9	Other	Not included in the map	

The examples provided below include a build map and the final AMT map (which is a subset of the build map).

Table 6 below identifies an issue with individual map ID 3. The source concept could partially match a number of concepts in the AMT, but here, an additional data field 'Year of Issue' has been included to enable the map to be completed. When the issue was first discovered the status would have been 'seek clinical advice'. On resolution the status is updated to reflect the outcome, in this case 'mapped'.

Only those concepts which have a status of mapped shall be included in the AMT map.

Table 6: Sample build map (at TPP level) showing complex map structure

Map ID	Source ID	Source Description	Year of Issue (additional field from source data)	Target ID (AMT concept ID)	Target Description (AMT Preferred Term)	Additional Descriptions from Target data AMT fully specified name	Match type	Mapper	Status	Issue
1	2234-55jjc-a	Alprazolam-DP 1mg Tablets, 50		13885011000036103	Alprazolam-DP 1 mg tablet, 50	Alprazolam-DP (alprazolam 1 mg) tablet, 50 tablets (trade product pack)	1	MS	Mapped	
2	9982-8891ra	APO Pantoprazole 40mg Tablets, 30		84018011000036102	Pantoprazole (Apotex) 40 mg tablet: enteric-coated, 30 tablets	Pantoprazole (Apotex) (pantoprazole (as sodium sesquihydrate) 40 mg) tablet: enteric-coated, 30 tablets (trade product pack)	2	AG	Mapped	APO and Apotex are different representations of the same supplier. Product only available as enteric coated tablets. Confirmed product equivalent.
3	88332134-audk54	Fluvax injection, 1 x 0.5 mL syringe	2011	929552011000036100	Fluvax 2011 injection: suspension, 1 x 0.5 mL syringe	Fluvax 2011 (A/California/7/2009 (H1N1)-like strain (A/California/7/2009 (NYMC X-181)) 15 microgram + A/Perth/16/2009 (H3N2)-like strain (A/Victoria/210/2009 (NYMC X-187)) 15 microgram + B/Brisbane/60/2008-like strain (B/Brisbane/60/2008) 15 microgram) injection: suspension, 1 x 0.5 mL syringe (trade product pack)	3	TC	Mapped	There are many potential matches to this code, depending on the year of issue. Use additional information from source data (year of issue) to confirm equivalence with AMT Mapping rule applied

The following table shows the build map converted to the final AMT map.

Table 7: Sample AMT map (at TPP level)

Map ID	Source ID	Source Description	Target ID (AMT Concept ID)	Target Description (AMT Preferred Term)
1	223455jjc-a	Alprazolam-DP 1mg Tablets, 50	3097011000036106	Alprazolam-DP 1 mg tablet, 50
2	99828891ra	APO Pantoprazole 40 mg Tablets, 30	83541011000036101	Pantoprazole (Apotex) 40 mg tablet: enteric-coated, 30 tablets
3	88332134-audk54	Fluvax injection, 1 x 0.5 mL syringe	929552011000036100	Fluvax 2011 injection: suspension, 1 x 0.5 mL syringe

3.6.3 Personnel

Mapping requires a multidisciplinary group of people to administer the development of the map, undertake the actual mapping, verify content, determine the action where there is a discrepancy, test, document, and release the map.

It is the responsibility of the owner of the map to ensure that an appropriately skilled team is used to develop and maintain their map. This responsibility is true for internally or externally developed maps. The qualifications of team members and the skills they represent should be recorded in the documentation of the mapping process.

Skills required include:

Clinical Expertise and understanding of the discipline and the way in which the concepts in the result of the map will be used in clinical practice. In order to provide appropriate advice these individuals should have actual clinical practice experience. Their role is to provide decisions on the clinical safety and appropriateness of the results of each individual map.

Source Expertise and understanding of the source content and structure in order to ensure that the meaning of the source is clearly understood.

Target Expertise and understanding of the target content and structure in order to ensure that the meaning of the target is clearly understood.

Technical Expertise and understanding of the computer systems from which the source data originates, the system in which the target data will be used, and the automated process to transform the data from the source to the target.

Administrative Management of the process and project, ensuring repeatability, quality, risk management (minimisation of patient risk) and consistency (See Section 3.8 for risk management details).

The IHTSDO has identified the broad groups of personnel required and the competencies they require [IHTSDO2009a]. Table 8 is based upon this work and provides a short description of these requirements to assist in building or selecting appropriate staff or organisations to undertake map building and maintenance.

It is suggested that mapping personnel have the following competencies:

- Understand and be able to apply the structure, content and relationships for the local/proprietary code system and the AMT.
- Understand and explain the purpose of the map.
- Be able to apply the basic concepts of description logic (the logic and relationships used to define concepts within the AMT). This is necessary to be able to determine if two concepts are actually equal or not.
- Understand the way in which the computer system will use the map.
- Understand the processes associated with release of new versions of the AMT.
- Principles of pharmacology and pharmaceutical formulations – the relevant personnel must understand what is meant by the concepts included in the AMT and understand their use and meaning in a clinical setting in order to assess clinical risk.

Though teams may be small, each of the roles indicated below need to be accounted for. In a small team the mapping manager and specialist may be the same individual.

Table 8: Mapping personnel roles and competencies

Role	Brief description of the responsibilities	Competencies
Mapping Manager	Responsible for the conduct and documentation of the process, ensuring that decisions are logical, appropriate staff allocated to all tasks and appropriate processes employed.	In addition to general skills required in project management and being an experienced mapping specialist this person must be able to: • Design and apply change management principles and version control. • Design and apply mapping quality assurance processes. • Design and apply verification and testing processes suited to the purpose and content of the map. • Assess the risks and strengths of mapping versus conversion to the AMT.
Mapping Specialist	Responsible for actually mapping content from one system to another.	In addition to general terminology skills: • Use understanding of the description logic applicable to the terminology to identify the level of match between the source and the target code. • Use tools designed to assist and support the mapping process. • Apply the mapping process. • Develop and apply quality assurance measures to map content and production. • Consistently apply the rules established for the map.

Role	Brief description of the responsibilities	Competencies
Clinical Map Advisor	Responsible for clinical and pharmaceutical guidance where the meaning of either source or target is unclear.	In addition to clinical skills: • Apply the description logic used in the terminology to determine meaning consistently. • Consistently apply the rules established for the map.
Technical Advisor	Responsible for the technical utility and release of the map for technical use.	In addition to IT/IS skills: • Design and apply mapping structure and rule automation. • Design and build file structures to support the building and release of the map. • Document release processes for use of the map in software.

3.7 Step 4: Tools

Tools include both computer tools to support building the map, software to browse the AMT in order to manually map concepts, and to investigate alternative map results where there are issues or alternatives.

All tools used should be evaluated against the following requirements and assessed to establish if they are appropriate to use in AMT mapping:

- The tool must include the AMT.
- Appropriate filters to limit the map to a specific hierarchy should be available.
- The tool should map against fully specified names. The ability to remove or ignore the hierarchy label (semantic tag) may assist the matching process.
- Only concepts with a status of 'Active' should be included for mapping.
- The tool needs to be able to display details of the concept and their relationships to one another.
- Auto mapped items need to be identified as such for further validation.
- The tool should be able to record comments and resolutions.
- The tool should produce a computable version of the AMT map.
- Limit to a specific AMT reference set.
- Record the version of local/proprietary code system and the AMT.

3.7.1 Automatic mapping

Automatic mapping is the process where software automatically compares the descriptions of the local code system to those used in the AMT. Where these are the same it can automatically build the map including the concept identifiers and descriptions from the local/proprietary code system and the AMT concept ID and Fully Specified Name.

If pre-processing of the data is to be undertaken, then this should take place prior to automatic mapping. See Section 3.9 for details.

The automatic mapping process is conducted before manual mapping and can significantly reduce the manual effort required to map, and also has the potential to improve the accuracy of the map. Consideration should be given to how accurate the automatic mapping process will be. Though a tool may have been used in the past it is necessary to confirm that the tool is current and relevant to the task on each occasion that it is used to build a map.

The following example quality assurance processes may help to improve automatic mapping results:

- Establish a threshold to consider an item to be a match (must match one and only one entry in the AMT).
- Establish filters to consider map results only from a given level or hierarchy of the AMT (e.g. only TPP concepts).

As the automated mapping function may not be guaranteed to be 100% accurate, each automatically-mapped source term should be manually validated against the result from the AMT. A record should be kept of any automatic mapping errors to assist in improvement of the process in future.

After the automap function is run, the remainder of the file is manually mapped.

3.7.2 Manual mapping

Manual mapping requires the use of a browser to manually search the AMT to find the local code system concept in the AMT. The result is then manually recorded in the build table (often a spreadsheet). This method is very time-consuming and prone to error due to copying and pasting from the browser into the build table. The use of a mapping tool, which integrates a terminology browser together with a mechanism for recording the mapping results, can increase the efficiency and accuracy of the mapping process.

A mapping tool may allow auto-map and manual map functionality and allow the production of a consolidated output.

After each stage of the process, including automatic mapping processes, it is advisable to check that the number of items in the build table is the same to ensure that there have been no unintended additions, duplications or deletions.

3.8 Step 5: Risk management approach

The mapping of terminologies has obvious patient safety implications. When local/proprietary terms are incorrectly or imprecisely mapped to AMT concepts, or the maps are incorrectly used:

- The clinical system may display medicine information inappropriately or in a manner that is unclear or misleading in the context in which it is presented.
- The inappropriate medication and preparations may be prescribed, recorded, dispensed or administered, potentially causing harm to patients.
- Misleading or inaccurate information may appear in a patient's medicine record, which may lead to harmful clinical decisions.

Example:

Different clinical systems may use slightly different variations in the terms used to describe and record a concept which may cause confusion with clinicians. A concept such as 'APO Pantoprazole 40mg Tablets, 30' in the local system mapped to 'Pantoprazole (Apotex) 40 mg tablet: enteric-coated, 30 tablets' represents a significant dose form variation between the source and the AMT terms which might cause confusion in dispensing or additional later prescribing. In this case, the products are identical, however, the discrepancy arises due to the source description not capturing the level of detail found in the AMT preferred term.

To minimise patient safety risks associated with the usage of AMT maps, a risk management approach or plan for patient safety risks should be clearly defined prior to commencing the mapping activity and should be followed throughout the entire mapping process through to validation, production, release and ongoing maintenance. The developer may use any risk management methodology that is relevant to the context of their organisation. However as a minimum, the developer should:

- clearly identify all patient safety risks that may arise from using the developed maps in clinical settings;
- perform and document risk assessment including definition of the likelihoods and these impacts;
- formulate, document and implement risk mitigation measures; and
- undertake and document the risk management activities not only during the mapping process but also for ongoing maintenance of maps.

Risk scoring and classification should form a part of risk assessment so that the level of effort in addressing each risk can be prioritised. It also provides consistency in ongoing risk management. The following table includes an example of a risk scoring and classification framework for patient safety risks. This is an example only and the developer should use a risk scoring scheme that is most relevant to their mapping process.

Table 9: Example of a risk scoring scheme for patient safety risks

Risk scoring Risk score is obtained by multiplying the likelihood score by the consequence score.			**Likelihood score**				
			1	**2**	**3**	**4**	**5**
			Rare	**Unlikely**	**Possible**	**Likely**	**Almost certain**
Consequence / impact score	**5**	**Catastrophic**	5	10	15	20	25
	4	**Major**	4	8	12	16	20
	3	**Moderate**	3	6	9	12	15
	2	**Minor**	2	4	6	8	10
	1	**Negligible**	1	2	3	4	5

Extreme risk	15 to 25
High risk	8 to 12
Moderate risk	4 to 6
Low risk	1 to 3

Example:

Some drugs represent a low clinical risk (such as over the counter medications) and if slightly misrepresented might be clinically acceptable, while others might be highly dangerous if not used in the correct circumstances and would be high risk if not an exact match. This would be an additional column to be included in the map structure.

3.9 Steps 6 to 8: Pre-processing source terms

The terms to be included in a map need to be determined. Exclusion of concepts which are not current, or restriction to terms in a specific AMT hierarchy are common requirements when first establishing what is to be included in the map. Variations are also likely to exist in the way a concept is described between the local/proprietary code system and the AMT. In order to support automated mapping processes, the more similar the structure and representation of data between the descriptions in each system, the more likely matching is to be accurate.

Example:

Local system:	Viagra (sildenafil (as citrate) 100mg) tablet: film-coated, 1 tablet
AMT:	Viagra (sildenafil (as citrate) 100 mg) tablet: film-coated, 1 tablet (trade product unit of use)

Pre-processing modifies the local system description so that it will match the format used in the AMT. Moreover, pre-processing defines the sequence of terms used and changes the local system representation in the build map (not the original text used in the live system) to minimise the amount of manual mapping required.

3.9.1 Step 6: Is pre-processing required?

Pharmaceuticals are complex concepts with many attributes. Different systems structure their representation of these concepts in different ways. In order to automate the mapping process as much as possible, it is best if the source terms and relationships are able to be consistently compared to those in the AMT.

Pre-processing must not change the meaning of the term in any way, but may be required to change the way that the text that describes the term is represented in order to support automated comparison.

For this reason there are advantages to ‘pre-processing’ the local system descriptions for mapping. All changes made to the local system descriptions must be recorded. This not only supports compliance and risk assessment but also maintenance of the map content, as the process can be repeated when either the local system or the AMT are changed.

Pre-processing may be undertaken in the build map and thereby not affect the descriptions used in the local system, or the local system can be modified to make it more consistent with the AMT, which will improve the potential for automating the map into the future.

3.9.2 Step 7: Document pre-processing process

Where pre-processing is undertaken, the methods used to modify concept descriptions must be documented in order to be included in risk assessment, and to ensure that the process can be accurately duplicated the next time the map is updated. Step 8 provides examples of what would be documented.

3.9.3 Step 8: Carry out the pre-processing process

When all pre-processing rules have been established, each of the rules should be automatically processed in order to change the descriptions of the local code system descriptions.

Precautions and verification of the pre-processed descriptions should be taken to ensure that any automated changes made to the data do not have unexpected consequences, e.g. addition of a space before 'mg' should not result in a space in a word which includes the letters mg.

The example below indicates how pre-prepared data for mapping might be defined.

Example 8-1:

Units of measure in the local code system are different to the units of measure used in the AMT.

It was possible to automatically modify the text describing a medication to represent the unit of measure (UOM) associated with the strength of a medication to match the AMT. The local system displays medication strength with no space between the strength and UOM, for example, 25mg, in contrast to the AMT which has a space between both components (25 mg). Where appropriate, spaces were created before the UOM in the local code system descriptions.

Spaces were created before the following units of measure, e.g. 20mg changed to 20 mg:

- mL
- mg
- kg
- cm

For each case the actual changes should be verified and the rationale behind them must be recorded. This supports the maintenance of the map in future as well as evaluation of the quality of the mapping processes for compliance purposes. Table 10 and Table 11 show examples of table change documentation.

Table 10: Example 8-1 – changes made to source terms

Change Made	Change made to	Reason for change
Where the units were found, a single space was added in front of the text.	• mL • mg • kg • cm	The AMT has a space between the units of measure indicated here. A space was added to make the source and target consistent

Example 8-2:

Local code system:	Fluvax (influenza virus vaccine) injection: 0.5mL syringe
AMT:	Fluvax 2011 (A/California/7/2009 (H1N1)-like strain (A/California/7/2009 (NYMC X-181)) 15 microgram + A/Perth/16/2009 (H3N2)-like strain (A/Victoria/210/2009 (NYMC X-187)) 15 microgram + B/Brisbane/60/2008-like strain (B/Brisbane/60/2008) 15 microgram) injection: suspension, 0.5 mL syringe (trade product unit of use)
Issue:	The AMT is more specific than the local code system but the local system has the year of manufacture in a separate field which is to be used to gather the additional information.

Table 11: Example 8-2 – changes made to source terms

Change Made	Change made to	Reason for change
Each medication description with an associated 'year of issue' date was modified to include the date after the medication name.	• Medication description • Year of issue	Concatenate the medication name and year of manufacture into the local code system description when the pre-processing for mapping is undertaken to generate entries that can be accurately and completely mapped.

As the AMT contains descriptions that describe concepts, the AMT Trade Product Pack (TPP) term is made up of a number of components; the brand name, ingredients (in the Fully Specified Name), strength, form and pack size. This might be different to the local code system where the application stores data as discrete elements within a product record. Based on the fields within the local code system database this can be resolved by concatenation of five fields, as shown below, to create a list of source terms which could be mapped to TPP level within the AMT. A TPP includes the components shown below:

- <brand> (<generic name> <strength>) <form>, <packsize/quantity> (semantic tag)

For example:

- Ircal (paraffin 1 g/1 g) eye ointment, 2 x 3.5 g tubes (trade product pack)
- Augmentin Duo 500/125 (amoxycillin (as trihydrate) 500 mg + clavulanic acid (as potassium) 125 mg) tablet: film-coated, 10 tablets (trade product pack)

Refer to Section 6 for the components, including examples, of each of the concept groups.

3.10 Steps 9 to 12: Building the map

3.10.1 Step 9: Mapping source to target

Building the map includes multiple processes. The use of automated tools may be included, followed by manual mapping, or the map may be built completely manually. Whichever process is used, the build must include quality processes for issue resolution. Local code system concepts should be mapped to the equivalent AMT concept with the Preferred Term description included in the final AMT map. Depending on the structure of the source data, the unique AMT Fully Specified Name might be used as the initial target description in the build map process.

3.10.2 Step 10: Performing automated mapping

This step is included if an automated mapping tool is being used and data has been pre-processed. The build table source terms will be processed using the tool with appropriate filters specified to identify a single match in the AMT. A record must be kept of the tool used (including the version of the tool), the filters used and the number of matches achieved through the automatic mapping process. Any verification of the mapping process employed must also be indicated.

3.10.3 Step 11: Performing manual mapping

Even the best automated mapping process is likely to leave some concepts that require manual mapping.

Each source term should be mapped and verified by a mapping specialist. The mapping specialist either creates a map or confirms automated mapping results for each individual entry in the build table. They may use a terminology browser to find the equivalent term from within the correct AMT hierarchy and should record the AMT concept identifier (SctId) and the AMT description (Preferred Term). Also recorded is the map type (level of equivalence), any relevant rules applied, and where the terms are not equivalent or could be clinically misleading, a description of the issue. In this last case a target (AMT) concept might not be included in the build map. The status of the map should be updated to indicate whether the original concept has been mapped, or sent for clinical adjudication, or a rule applied or a decision made not to map the concept.

3.10.4 Step 12: Documentation of issues

Issues may arise where it might not be clear whether the concepts match or not, or where clinical clarification is required. In this case the person undertaking the manual mapping or verification must clearly document the issue. A record of all issues and how they are resolved should be maintained.

Example:	
Local System Description:	APO Pantoprazole 40mg Tablets
AMT:	Pantoprazole (Apotex) 40 mg tablet: enteric-coated, 30 tablets
Issue:	The dose form variation between the source term (local system) and the target term (AMT) may cause confusion. Please advise whether for the purpose of this map this should be considered a match or not.

3.11 Step 13: Conflict resolution

This process requires clinical input and is usually led by the mapping manager in order to ensure consistent application of mapping decisions developed during the mapping process. The objective is to reach a decision on the appropriate map from the source to the target for each relevant concept that is terminologically sound and clinically safe.

All decisions must be documented and this document should be generic where possible.

Suitably experienced and qualified clinical expertise is required to provide clinical governance and to resolve issues identified when mapping. The conflict resolution process requires clinical adjudication on the appropriate action.

Actions might include:

- Advice on the match type – deciding that the concepts can be considered to be the same (and therefore allocate a match type of '2') or deciding that this concept should not be mapped as doing so would represent a clinical safety issue (map type: not mapped).
- Advice that is general and should be applied whenever a given situation occurs anywhere in the mapping process. Decisions such as these should always generate a documented record of the agreed way to handle the situation. For example it might be agreed that the terms 'oral solution' and 'oral liquid' will be considered to be synonyms in all cases.

This process supports the development of a reproducible methodology that uses patient safety as the primary guide to decisions made.

3.12 Step 14: Validation

There are different methods that can be used to validate the accuracy of the map content.

3.12.1 Sampling validation

This method involves selecting a sample set from the whole map and validating each sample map entry. To ensure unbiased validation, validation is performed by personnel who are not involved in developing the maps. If the sample set is considered valid for the pre-defined purpose of the map, then the whole map is assumed to be valid.

The sample size, the sampling approach and acceptable error rate should be carefully determined in advance based on the risk profile and the purpose of the map relevant to each mapping project.

One recommended example of a sampling approach is 'grouped random selection'. In this approach the map source terms are divided into logical groups of choice, for example by frequency of use or by product types. The product types may include single-ingredient, multi-ingredient, multi-component, sub-packs and high-risk medications such as the 'PINCH' drugs – potassium, insulin, narcotics, chemotherapy, heparin and systems. Then the map entries associated with the source terms from each group are randomly selected to create the sample set, ensuring that the entries from all groups are represented in the sample set. Afterwards, each entry from the sample set is validated. Depending on the quality of the sample set, a review of the mapping process may be needed.

The sampling validation method does not necessarily validate the whole map as there may be incorrect maps that are not in the sample set. Therefore it may only be a suitable method for ongoing maintenance of the maps with mature automated mapping processes.

3.12.2 Dual mapping

When converting data, or where assurance of a high quality map is required, dual mapping should be employed. The use of dual mapping provides a validation mechanism reducing inadvertent manual or computer-based errors from getting through to the final map and is recommended by the IHTSDO for production of a high quality map.

This process is depicted in Figure 7 below. Two mapping specialists each create their own individual maps from the local/proprietary system concept (source) to the AMT concept (target). Only when each mapping specialist produces the same target AMT term is the map considered to be correct. All other terms require documentation of issues and then conflict resolution by the clinical map advisor to determine appropriate action. If this approach is taken, a sample set to validate is not required.

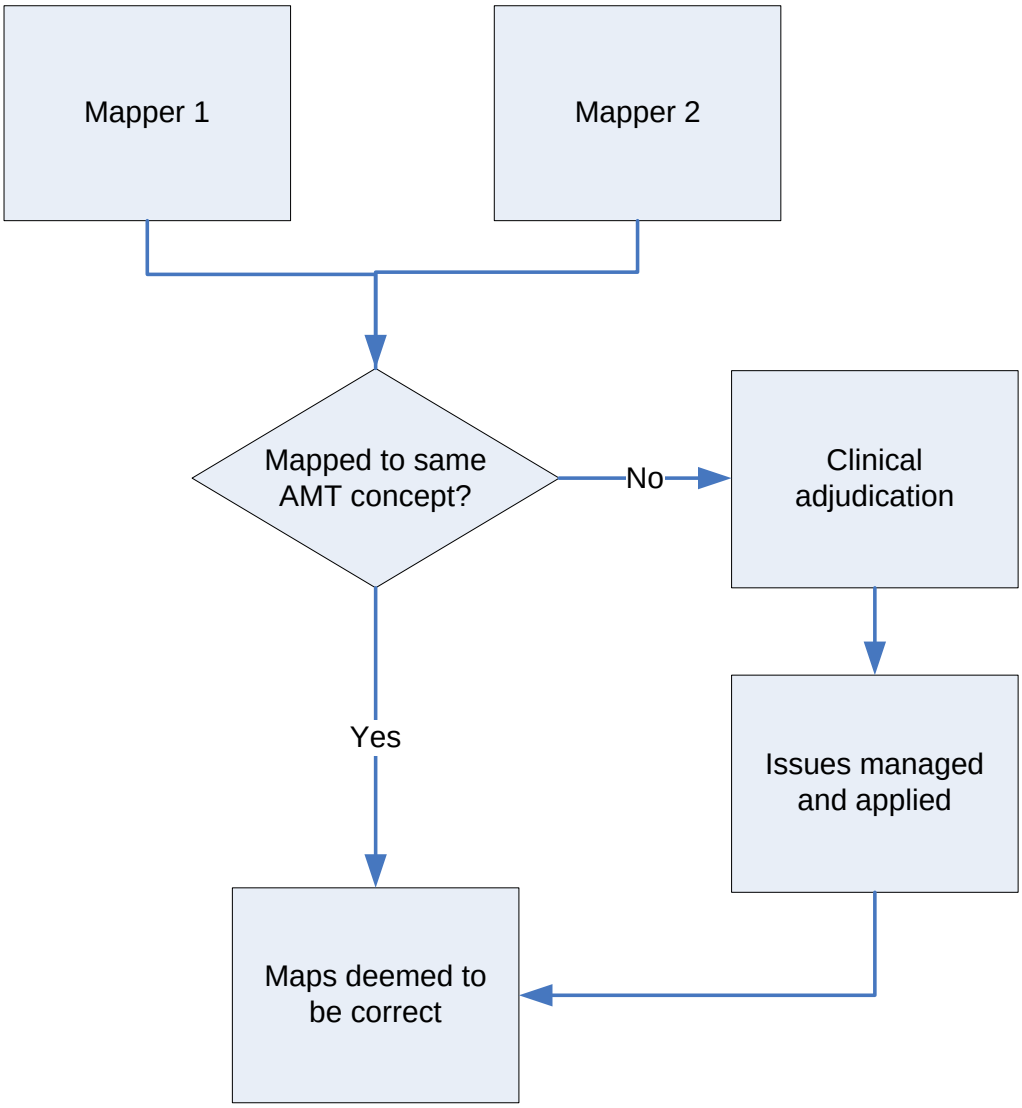

Figure 7: Dual mapping process

Dual validation is a similar process which is conducted after the individual maps have been built. This process is where more than one (usually two) validators independently review the results of the initial map as created by another person (or automatically). The map is only considered to be correct when both validators confirm the target AMT term. All other terms require documentation of issues and conflict resolution.

Options for mapping and validation include:

- Dual map, single (or automated) review
- Single map, dual review
- Dual map, dual review

3.12.3 Backwards mapping

Backward mapping is when a map built to translate data from the local or proprietary code system to the AMT is used in the reverse order, to translate from the AMT to the local system.

This can be useful when validating the content of the map, as backward mapping can highlight typographical and other errors in the map including semantic-based rules that are not valid in the reverse direction (and hence invalidating the map for use as a bidirectional map). This approach, however is insufficient validation alone, but can be applied with either sampling or dual mapping to improve the quality of the map.

When mapping to the AMT it is recommended that only those concepts which are lexically and/or semantically equivalent be used so that patient safety is not affected by any differences between concept descriptions. Quality maps from the source to the AMT that are also valid both to and from the AMT may prove useful to translate data in both directions, thereby providing a map which can be used more extensively.

3.13 Step 15: Quality review

The quality review process should be undertaken by all involved in the development of the map and a selection of stakeholders or users of the map. The purpose of this exercise is to identify improvements that could be made to the AMT and to the mapping process for future use and to determine whether the map is fit for clinical use.

The quality review process should include:

- Review of the clinical audit process to ensure consistency of advice provided and rules developed or applied to ensure that clinical risk has been appropriately assessed and minimised.
- Review of validation results to ensure appropriate accuracy of the AMT map.
- Identification of concepts relevant for inclusion in the AMT, or modifications appropriate to the AMT – and submission of request for change/addition (see Section 3.14).
- Review of documentation to ensure completeness and clarity as well as appropriateness of instructions.
- Review of release processes to identify issues or improvements.
- Documentation of lessons learnt in the process through the review of results and discussion with those involved in the development of the map and the process.

3.13.1 Process improvement

Consideration should be given to the methodology and tools used and changes made to reflect lessons learnt, so that the next production of the map will be an improvement upon this iteration.

Such changes and the rationale behind them should be documented.

3.14 Step 16: Request submission

If the developer finds any material error or change or correction needed in the AMT or would like to recommend an improvement, they are encouraged to submit a request to NEHTA. NEHTA is committed to refinement and improvement of the AMT content.

The *AMT Request Submission Template* [NEHTA2011h], available on the NCTIS website[2], should be used completing all required information as indicated. The *Guidelines for Submitting Requests* [NEHTA2010d] contains helpful information on how to use this template. On completion, the email request with all supporting documentation should be sent to NEHTA at terminologies@nehta.gov.au.

3.15 Step 17: Documentation

Documentation of the mapping methodology and decisions made can be used not only to reproduce the mapping process when either the local/proprietary code system or the AMT are changed, but also as an evidence of the mapping process undertaken and rules applied for compliance assessment. Documentation should include all of the following:

- A clear statement of the source (local/proprietary code system) and the target (the AMT), including versions of both systems used.
- The purpose of the map.
- Scenarios of the map's intended use.
- The intended users of the map.
- The AMT concept level(s) to which the local/proprietary code system is mapped, indicating clinically appropriate reasons for this level.
- The pre-processing undertaken, including specification of terms not included in the map, and processes used to modify the source terms prior to mapping. Details of changes made to which attributes and the reasons for each change should also be included.
- Personnel – persons involved in the mapping process and their qualifications identifying the role played by the individual as well as the skills offered by them. Any evidence of competency should be included in the documentation.
- Tools used – an indication of tools used, along with their capabilities and limitations.
- The mapping process used.
- The issues resolution process and any common approaches incorporated, or rules to be applied to the map or the map development process, and the conflict resolution process.
- The validation process (including sampling methods).
- The risk management process.
- The risk profile of patient safety risk associated with using this map.

3.16 Steps 18 to 20: Release

3.16.1 Step 18: Produce the final AMT map

To produce the final AMT map the build map is used as the basis and is retained as documentation of the mapping process.

Individual map entries which are not mapped (not of sufficient accuracy to be included in the map) are removed.

Those fields used to manage the building of the map are removed. This includes fields such as mapper, issues, and status.

[2] https://nehta.org.au/aht/index.php.

This results in the final AMT map which includes source ID, source concept (description), AMT concept ID (SctId) and AMT Preferred Term. The version of the map should be recorded.

3.16.2 Step 19: Release documentation

Documentation should be provided to accompany the release of the AMT map. This should include details of the structure and format of the map to assist those using the map. Details of map purpose, scope etc., and decisions made when developing the map should also be included as these may impact the way that the map is used.

Version control on the documentation and the map should be consistent with each other.

3.16.3 Step 20: Release of the AMT map

Prior to release, the developer should undertake the AMT conformity assessment process [NEHTA2011g] to ensure that the maps have been developed in line with NEHTA guidelines and *AMT mapping requirements* [NEHTA2012].

The map should be released on a specified date and this data should be clearly indicated on all documentation.

3.17 Maintenance

When either the source or the AMT is updated the map should be rebuilt. Assessment of the update of either the source or the AMT might conclude that mapped concepts have not changed, in which case the map need not be rebuilt. It is necessary to assess clinical risk related to changes in either the source or the AMT. Rebuilding should be undertaken when mapped concepts in either the source or the AMT change, e.g. if a new release of the local term set includes a new term that will need to be added to the map, and if terms in the AMT change, the maps to those concepts will need to be rebuilt.

Rebuilding may be restricted to specific changed terms but each individual map entry should be developed following the same process as the original build (recognising improvements identified during the quality review process). Where changes in process might impact the validity of existing mapped concepts, consideration should be given to rebuilding these individual maps.

The update process should result in an updated AMT map and updated documentation, as well as release documentation.

4 Compliance requirements

Compliance requirements for the AMT mapping process are specified in *AMT mapping requirements* [NEHTA2012].

5 Sample scenarios

These scenarios illustrate the concept mapping levels summarised in Table 2 (p.20).

5.1 Medicinal Product (MP)

This is an abstract representation of the active ingredient(s), contained within a discrete unit of use of a Trade Product. It is devoid of strength and form.

Note: A single MP will not exist when the active ingredients do not exist in the same dose form, e.g. Nexium Hp7.

5.1.1 Record

This concept supports the recording of a medicinal product at a most general level of detail as may be required in some medication records, health records, or medication lists. It may be used to record an allergy or adverse reaction to a medicinal product or enable other decision support mechanisms.

Scenario:

Mrs Evans develops a nasty rash shortly after commencing treatment with an antibiotic for a respiratory infection. She returns to her GP who suspects an allergy to the medicine. The allergy is noted as amoxycillin + clavulanic acid (MP) in the GP's patient medical record.

5.1.2 Report

This concept supports the exchange of recorded clinical information, e.g. discharge summary, referral, or prescription.

Scenario:

Mr Kane experiences nausea and vomiting during his stay in hospital. He is seen by the doctor who suspects the adverse reactions are due to the fusidic acid (MP). The incident is noted in the patient's medical records and is reported back to the GP on his discharge summary.

5.2 Medicinal Product Pack (MPP)

This is an abstract concept representing the properties of one or more quantitatively and clinically equivalent Trade Product Packs.

5.2.1 Prescribe

This concept supports generic prescribing as may occur in multiple healthcare settings.

Scenario:

Mr Adams visits his doctor after developing tonsillitis. He refuses to take capsules as they cause discomfort on swallowing. The doctor writes a prescription for amoxycillin 500 mg/5 mL oral liquid: powder for, 100 mL as he cannot recall the brand name of the liquid product equivalent to the capsule.

5.2.2 Record

This concept supports the recording of a medicinal product (when trade name is not required) in a patient/clinical information records as may occur in multiple healthcare settings.

Scenario:

On completing the prescription for Mr Adams, the doctor records amoxycillin 500 mg/5 mL oral liquid: powder for, 100 mL (MPP) in his patient's record under his current medication list.

5.2.3 Report

This concept supports the exchange of recorded clinical information, e.g. discharge summary, referral, or prescription.

Scenario:

Mr Adams returns to his GP with ongoing erectile dysfunction disorder despite treatment with oral medication. The GP writes a referral to a urologist which includes a current medications list, identifying amoxycillin 500 mg/5 mL oral liquid: powder for, 100 mL (MPP) and sildenafil 100 mg tablet, 4 (MPP).

5.3 Medicinal Product Unit of Use (MPUU)

This is an abstract concept representing a single dose unit of an equivalent Trade Product.

5.3.1 Prescribe

This concept supports generic prescribing of a single dose unit as typically occurs in the secondary healthcare setting, e.g. inpatient, acute care.

Scenario:

Mr Kane is a 74 year-old man who has been admitted to hospital for surgery for total knee replacement. He is prescribed with a paracetamol 500 mg + codeine phosphate 30 mg tablet (MPUU) for pain by the orthopaedic surgeon.

5.3.2 Record

This concept supports the recording of single dose unit of medicine in patient/clinical information records as typically occurs in the secondary healthcare setting, e.g. inpatient, acute care.

Scenario:

During surgery Mr Kane is administered a haemostatic to reduce postoperative blood loss. The orthopaedic resident records in the patient medication chart tranexamic acid 1 g/10 mL injection, 1 x 10 mL ampoule (MPUU), along with the dose given and plan for the duration of treatment.

5.3.3 Report

This concept supports the exchange of recorded clinical information, e.g. discharge summary, referral, or prescription.

Scenario:

Mr Kane is discharged from hospital with fusidate sodium 250 mg tablets (MPUU) which is documented on the discharge summary to his GP, the infectious disease specialist and the orthopaedic surgeon.

5.4 Trade Product (TP)

This concept represents the product brand name for a single product or family of products sharing the same base of an active ingredient. It is devoid of form and strength. For example, Panadeine (TP) represents the following products: Panadeine Tablet, Panadeine Caplet, Panadeine Rapid, Panadeine Forte, Panadeine Extra.

5.4.1 Record

This concept supports the recording of a Trade product at a high level where a lower level of detail or product specificity is not required.

Scenario:

Sylvia is taken by her family to the emergency department with severe nausea and vomiting. The nurse asks her if she is taking any medication. Sylvia reports that she is taking Panadeine but cannot be more specific or confirm the exact name on the box. The nurse records Panadeine (TP) on her admission notes.

5.4.2 Report

This concept supports the exchange of recorded clinical information, e.g. discharge summary, referral, or prescription.

Scenario:

The doctor reports a possible adverse event to Panadeine (TP) on Sylvia's discharge summary that is sent back to her GP.

5.5 Trade Product Pack (TPP)

This concept represents the packaged trade product that is supplied for direct patient use.

5.5.1 Prescribe

This concept supports the prescribing of a branded product as typically occurs in the primary healthcare setting, e.g. general practice. It also supports prescribing where generic prescriptions are not always appropriate including PBS prescriptions, multi-component and some multi-ingredient medicines.

Scenario:

The GP diagnoses Tim with a bacterial respiratory infection and writes a prescription for Amoxil 500 mg capsule: hard, 20 capsules (TPP) with 1 repeat giving instruction for 1 capsule to be taken three times daily for 7 days.

5.5.2 Issue

This concept supports the dispensing of all packaged products as supplied by manufacturer from the pharmacy where the specified container type is not applicable, either for patient need or dispense records.

Scenario:

On presentation at the pharmacy for Tim's script for Amoxil 500 mg capsule: hard, 20 capsules (TPP) with 1 repeat, the pharmacy dispenses the cheaper brand as requested, that being Amoxycillin (GenRx) 500 mg capsule: hard, 20 capsules (TPP).

5.5.3 Record

This concept supports the recording of a Trade product pack (when trade name is required) in a patient/clinical information records as may occur in multiple healthcare settings, most commonly primary care.

Scenario:

Maude visits the Travel Vaccination Centre prior to an overseas trip and brings along her current vaccination card. The doctor reviews the vaccination card and notes that she is up-to-date with most but given her age is at risk for developing the flu. He administers the flu vaccine and records Fluvax 2011 injection: suspension, 1 x 0.5 mL syringe (TPP) on her personal vaccination card and lets her know that he will notify her GP so that he does not duplicate the therapy.

5.5.4 Report

This concept supports the exchange of recorded clinical information, e.g. discharge summary, referral, or prescription.

Scenario:

Maude returns to her GP a couple of weeks later and is pleased to find that her GP has received a brief report for his records outlining medication administered including Fluvax 2011 injection: suspension, 1 x 0.5 mL syringe (TPP).

5.6 Trade Product Unit of Use (TPUU)

This concept represents a single dose unit of a trade product that is for direct patient use.

5.6.1 Prescribe

This concept supports prescribing of a single dose unit that may occur in some secondary healthcare settings, e.g. some private hospitals, aged care or where generic prescriptions are not always appropriate including PBS prescribing in outpatient settings, multi-component and some multi-ingredient medicines, or where brand substitution not desirable.

Scenario:

Mr Kane is a 74 year man who has been admitted to hospital for surgery for total knee replacement. He is prescribed Coumadin (warfarin sodium 2 mg) tablet: uncoated, 1 tablet (TPUU) as prophylaxis for venous thromboembolism. The surgeon has included the brand name on the medication order as Coumadin and Marevan (the two brands of warfarin available) are not interchangeable as bioequivalence has not been established.

5.6.2 Issue

This concept supports the dispensing of a single dose unit direct to the patient that typically occurs in secondary healthcare settings, e.g. inpatient, acute care, aged care.

Scenario:

Mr Kane is readmitted to the hospital with an infection to his knee. The infectious disease specialist prescribes vancomycin 1 g injection, 1 x 1 g vial (MPUU) and sends the orders for an IV antibiotic to the pharmacy. The inpatient pharmacy receives the order and dispenses Vancomycin (DBL) 1 g injection, 1 x 1 g vial (TPUU) as ordered.

5.6.3 Record

This concept supports the recording of single dose unit of medicine in patient/clinical information records as may occur in multiple healthcare settings, where inclusion of Trade is appropriate.

Scenario:

Sylvia returns to her GP after leaving hospital. He records in her clinical record the suspected adverse reaction to Panadeine Forte (paracetamol 500 mg + codeine phosphate 30 mg) tablet: uncoated, 1 tablet (TPUU), a medication he recently prescribed to her.

5.6.4 Report

This concept supports the exchange of recorded clinical information, e.g. discharge summary, referral, or prescription.

Scenario:

Mr Kane is discharged from hospital with a number of medicines including Coumadin (warfarin sodium 2 mg) tablet: uncoated, 1 tablet (TPUU) which are documented on the discharge summary to his GP, the infectious disease specialist and the orthopaedic surgeon.

5.6.5 Administer

This concept supports administration by providing the ingredient, strength, form and brand needed to identify the correct product for administration. This may occur in many healthcare settings, most typically in secondary and aged care but also primary care.

Scenario:

Mr Kane is back at the nursing home after being discharged from hospital and the nurse is ready to administer the midday dose of Panadeine Forte tablet: uncoated, 1 tablet (TPUU) from his dose administration aid pack.

5.7 Containered Trade Product Pack (CTPP)

This concept represents the containered packaged trade product that is supplied for direct patient use.

5.7.1 Prescribe

This concept supports the prescribing of a branded product in a particular container type, as may occur in the primary healthcare setting, e.g. general practice. It also supports prescribing where the container (if alternatives are available) may need to be specified due to individual patient need.

Scenario:

The doctor prescribes Temaze 10 mg tablet: uncoated, 25 tablets, bottle (CTPP) to her elderly patient Mr Kane as she has noted in his record that he has trouble popping tablets from small blister packs.

5.7.2 Issue

This concept supports the dispensing of all packaged products from the pharmacy where the container type (i.e. exact product) needs to be recorded. It corresponds exactly with what was issued to the patient.

Scenario:

Tim visits the pharmacy with a prescription for Amoxil 500 mg capsule: hard, 20 capsules (MPP) with 1 repeat giving instruction for 1 capsule to be taken three times daily for 7 days. The pharmacist dispenses the only available container type which is Amoxil 500 mg capsule: hard, 20 capsules, blister pack (CTPP).

5.7.3 Record

This concept supports the recording of all packaged products from the pharmacy where the container type (i.e. exact product) needs to be recorded. It records exactly with what was issued to the patient.

Scenario:

The pharmacy dispensing system records the recently dispensed medicine Amoxil 500 mg capsule: hard, 20 capsules, blister pack (CTPP).

5.7.4 Report

This concept supports the exchange of recorded clinical information, e.g. discharge summary, referral, or prescription.

Scenario:

Tim runs out of capsules while on holiday a week later. He luckily has his repeat script which shows supply of Amoxil 500 mg capsule: hard, 20 capsules, blister pack (CTPP) the previous week. The pharmacist completes the request and dispenses Tim his remaining medicine.

5.8 Substance

This is an abstract concept that represents a single active ingredient that may be compounded on its own or in combination with other active ingredients to form a medicinal product.

5.8.1 Record

This concept supports the recording of an allergy to the substance (or similar decision support function) where a source term in the proprietary dataset does not correspond to an MP in AMT but is more closely aligned with a substance.

Scenario:

Mrs Evans recently moved and makes an appointment to see a new GP. During the consultation she notifies him of a previously detected allergy to clavulanic acid. The GP discovers that there is no MP for clavulanic acid in his system as this substance is normally compounded with a penicillin antibiotic. He records this allergy in her medical record as clavulanic acid (AU substance).

5.8.2 Report

This concept supports the exchange of recorded clinical information, e.g. discharge summary, referral, or prescription.

Scenario:

The GP sends Mrs Evans to a respiratory physician to investigate her recurring chest infections. He sends a referral letter which includes her medical history and the allergy to clavulanic acid (AU substance).

6 AMT concept components and attributes

The attributes of each AMT concept class is defined, followed by one or more examples. Some classes have varying attributes to represent certain product types. The Fully Specified Name (FSN) term is provided in the examples.

Table 12: MP attributes

Attribute	Examples	Notes
<Substance>	• |21239011000036106 *aciclovir (medicinal product)*| • |21274011000036107 *potassium chloride (medicinal product)*|	These are FSN terms for MP concepts that represent a single ingredient product.
<Substance + Substance>	• |21286011000036106 *codeine + paracetamol (medicinal product)*|	This is an FSN term for an MP concept that represents a multi-ingredient product with ingredient order always alphabetically presented.
<Substance (&) Substance>	• |21940011000036102 *amoxycillin (&) clarithromycin (&) esomeprazole (medicinal product)*|	This is an FSN term for an MP concept that represents a multi-component product with ingredient order always alphabetically presented.

Table 13: MPUU attributes

Attribute	Examples	Notes
<Substance> <Strength> <Form> <Unit of Use>	• |23631011000036103 *aciclovir 200 mg tablet (medicinal product unit of use)*| • |70125011000036107 *potassium 1.17 g/10 mL | potassium chloride 2.23 g/10 mL injection, 10 mL vial (medicinal product unit of use)*| • |92699011000036101 *fluoride 1 mg/1 g | fluoride sodium 2.2 mg/1 g + triclosan 3 mg/1 g toothpaste (medicinal product unit of use)*|	

Table 14: MPP attributes

Attribute	Examples	Notes
<Substance> <Strength> <Form> <Unit of Use Quantity>	• |28317011000036105 *aciclovir 200 mg tablet, 25 tablets (medicinal product pack)*| • |82567011000036107 *potassium nitrate 25% + silver 48% | silver nitrate 75% stick, 100 sticks (medicinal product pack)*| See notes for details.	This is an FSN term for an MPP concept that represents a multi-ingredient product. Due to clinical relevance rules in AMT, one of its ingredients have both a representation of the base entity (i.e. silver) and clinically relevant salt entity (i.e. silver nitrate).
<Substance> <Strength> <Form> <Unit of Use Quantity> <Unit of Use Size>	• |71686011000036102 potassium *1.17 g/10 mL | potassium chloride 2.23 g/10 mL injection, 10 x 10 mL vials (medicinal product pack)*|	
<Substance> <Strength> <Form> <Unit of Use Quantity> <Unit of Use Size> <Total Quantity>	• |46311011000036109 *inert substance diluent [1 x 5 mL vial] (&) somatropin 3 mg injection [1 x 3 mg vial], 1 pack (medicinal product pack)*|	This is an FSN term for an MPP concept that represents a non-sequential multi-component product containing an active and a diluent component.
<Substance> <Strength> <Form> <Unit of Use Quantity> <Subpack Quantity>	• |26616011000036107 *ethinyloestradiol 30 microgram + levonorgestrel 150 microgram tablet, 84 tablets [4 x 21 tablets] (medicinal product pack)*|	This is an FSN term for an MPP concept that represents a sequential multi-component product containing subpacks.

Table 15: TP attributes

Attribute	Examples	Notes
<Trade Name>	• |3623011000036101 *Zovirax (trade product)*| • |3272011000036106 *Panadeine (trade product)*| See notes for details. • |65099011000036100 *Potassium Chloride (AstraZeneca) (trade product)*| • |51930011000036107 *Benzoic Acid Compound ointment (APF 20) (trade product)*|	This is an FSN term for a TP concept that represents the trade family name or root trade name. In this case the TP concept does not indicate 'Panadeine Forte'.

Table 16: TPUU attributes

Attribute	Examples	Notes
<Trade Name> <Substance> <Strength> <Form> <Unit of Use>	• |5915011000036103 *Zovirax (aciclovir 200 mg) tablet: dispersible, 1 tablet (trade product unit of use)*| • |65468011000036103 *Potassium Chloride (Phebra) (potassium chloride 2.23 g/10 mL) injection: concentrated, 10 mL vial (trade product unit of use)*| • |92565701100003610 0 *Colgate Total Whitening (fluoride sodium 2.2 mg/1 g + triclosan 3 mg/1 g) toothpaste (trade product unit of use)*|	

Table 17: TPP attributes

Attribute	Examples	Notes
<Trade Name> <Substance> <Strength> <Form> <Unit of Use Quantity>	• |12634011000036109 *Zovirax (aciclovir 200 mg) tablet: dispersible, 25 tablets (trade product pack)*| • |82202011000036104 *Silver Nitrate Applicator (Medical and Surgical Requisites) (potassium nitrate 25% + silver nitrate 75%) stick, 100 sticks (trade product pack)*|	
<Trade Name> <Substance> <Strength> <Form> <Unit of Use Quantity> <Unit of Use Size>	• |67121011000036103 *Potassium Chloride (Phebra) 2.23 g/10 mL (potassium 30 mmol/10 mL) injection: concentrated, 10 x 10 mL vials*|	
<Trade Name> <Substance> <Strength> <Form> <Unit of Use Quantity> <Unit of Use Size> <Total Quantity>	• |41463011000036100 *Saizen 3 (inert substance) diluent [1 x 5 mL vial] (&) (somatropin 3 mg) injection: powder for [1 x 3 mg vial], 1 pack (trade product pack)*|	This is an FSN term for a TPP concept that represents a non-sequential multi-component product containing an active and a diluent component.
<Trade Name> <Substance> <Strength> <Form> <Unit of Use Quantity> <Subpack Quantity>	• |11345011000036103 *Microgynon 30 (ethinyloestradiol 30 microgram + levonorgestrel 150 microgram) tablet: sugar-coated, 84 tablets [4 x 21 tablets] (trade product pack)*|	This is an FSN term for a TPP concept that represents a sequential multi-component product containing subpacks.

Table 18: CTPP attributes

Attribute	Examples	Notes
<Trade Name> <Substance> <Strength> <Form> <Unit of Use Quantity> <Container type>	• |19346011000036101 *Zovirax (aciclovir 200 mg) tablet: dispersible, 25 tablets, blister pack (containered trade product pack)*| • |82413011000036109 *Silver Nitrate Applicator (Medical and Surgical Requisites) (potassium nitrate 25% + silver nitrate 75%) stick, 100 sticks, tube (containered trade product pack)*|	
<Trade Name> <Substance> <Strength> <Form> <Unit of Use Quantity> <Unit of Use Size> <Container type>	• |69321011000036102 *Potassium Chloride (Phebra) (potassium chloride 2.23 g/10 mL) injection: concentrated, 10 x 10 mL vials, vial (containered trade product pack)*|	
<Trade Name> <Substance> <Strength> <Form> <Unit of Use Quantity> <Unit of Use Size> <Total Quantity> <Container type>	• |43971011000036100 *Saizen 3 (inert substance) diluent [1 x 5 mL vial] (&) (somatropin 3 mg) injection: powder for [1 x 3 mg vial], 1 pack, composite pack (containered trade product pack)*|	This is an FSN term for a CTPP concept that represents a non-sequential multi-component product containing an active and a diluent component.
<Trade Name> <Substance> <Strength> <Form> <Unit of Use Quantity> <Subpack Quantity> <Container type>	• |18413011000036106 *Microgynon 30 (ethinyloestradiol 30 microgram + levonorgestrel 150 microgram) tablet: sugar-coated, 84 tablets [4 x 21 tablets], blister pack (containered trade product pack)*|	This is an FSN term for a CTPP concept that represents a sequential multi-component product containing subpacks.

Table 19: Substance attributes

Attribute	Examples	Notes
<Substance>	• |1762011000036103 *aciclovir (AU substance)*| • |2500011000036101 *potassium chloride (AU substance)*| • |1979011000036106 *codeine phosphate (AU substance)*| • |2442011000036104 *paracetamol (AU substance)*|	

7 Multiple medicinal product concepts

7.1 Multiple Medicinal Product (MP) concepts for a product

There are certain products in AMT that have two related MP concepts. One MP concept represents the clinically significant salt entity and the other represents the base entity. Examples:

- |32675011000036108 *atropine (medicinal product)*|
- |21806011000036104 *atropine sulfate (medicinal product)*|

In general, the clinically significant salt entity (latter MP) should be used in mapping as it corresponds most closely to the Medicinal Product in clinical use.

However in certain cases both the base and salt entities can be used in mapping as both correspond to Medicinal Products in clinical use. Examples: |21443011000036108 *haloperidol (medicinal product)*| and |21866011000036100 *haloperidol decanoate (medicinal product)*|.

To identify the list of MP concepts to be used for mapping:

1. Use the *Medicinal product reference set*.
    a. The 'referencedComponentId' field contains the concept ids of MP concepts.
    b. All MP concepts with an 'active' field value = 1 can be used for mapping.
    c. This reference set file should be linked to the description file ('referencedComponentId' = 'conceptID') to identify the FSN or PT terms to be displayed ('term').
        i. To identify a FSN term, search for 'descriptionType' value of '3'.
        ii. To identify a PT term, search for 'descriptionType' value of '1'.

7.2 Multiple Medicinal Product (MPUU) concepts for a product

There are certain products in AMT that have two related MPUU concepts. One MPUU concept represents the salt entity and the other represents the base entity. Examples:

- |23998011000036100 *diclofenac 23.27 mg tablet (medicinal product unit of use)*|
- |23276011000036108 *diclofenac 23.27 mg | diclofenac sodium 25 mg tablet (medicinal product unit of use)*|

In general, the salt entity (latter MPUU) should be used in mapping as it corresponds most closely to the Medicinal Product Unit of Use in clinical use.

To identify the list of MPUU concepts to be used for mapping:

1. Use the *Medicinal product unit of use reference set*.
    a. The 'referencedComponentId' field contains the concept ids of MPUU concepts.
    b. All MPUU concepts with an 'active' field value = 1 can be used for mapping.

c. This reference set file should be linked to the description file (‘referencedComponentId’ = ‘conceptID’) to identify the FSN or PT terms to be displayed (‘term’).

   i. To identify a FSN term, search for ‘descriptionType’ value of ‘3’.

   ii. To identify a PT term, search for ‘descriptionType’ value of ‘1’.

8 References

This bibliography lists documents that provide information for or about this document. However, as all documents are subject to revision, readers are encouraged to use the most recent versions of these documents.

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Glossary

Acronym	Term	Meaning	Notes
	Assessment	Determining if specified requirements relating to a product, process, system, person or body or fulfilled.	
AMT	**Australian Medicines Terminology**		
	Auto-matching	A computational mapping task, undertaken using an algorithm.	Separate files of concept content from different coding systems are compared using an algorithm to determine whether there are concepts which match each other; that is, whether each coding system has content in common [NEHTA2005].
	Build map	A version of the map table used to contain individual maps and their status of each individual map to support map development.	Synonym: • Build Table.
	Classification	An exhaustive set of mutually-exclusive categories to aggregate data at a pre-prescribed level of specialization for a specific purpose.	Example: International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), International Standard Classification of Occupations. Classifications include a place, though not always specific, for all concepts required for the specific purpose of the classification. They include broad catch all categories and 'unspecified' sections to capture those concepts where it is not possible or practical for the purpose to be more specific [ISOTC215a].
	Clinical vocabulary	The language used by the clinical profession and industry [ISOTC215b].	

Acronym	Term	Meaning	Notes
	Coding system	A system of code sets, coding standards and code maintenance procedures together with their authorisation and governance.	Examples: ICD-10-AM Volume 1 – classification, Volume 2 – reference terminology, Volume 5 Coding standards. A generic term to describe a classification or terminology that is used to transform a representation of a concept to a coded representation. Coding systems applied in the mapping process are described as 'source' and 'target'. The source coding system is the system that supplies the concepts to be mapped. The target coding system is the system that contains the concepts which will provide comparable meaning via the map. (Modified from [AS5021].)
	Competency	A person's ability to undertake a role or perform a task including related dimensions of ability such as underpinning knowledge [IHTSDO2009a].	
	Compliance	The adherence to the requirements of laws, industry and organisational standards and codes, principles of good governance and accepted community and ethical standards.	
CCA	**Compliance, Conformance and Accreditation**	A NEHTA business unit tasked with assuring interoperability, security and clinical safety where health information is exchanged between health systems.	
	Concept	Related conditions and situations that provide a useful understanding and meaning of a subject.	Commonly described as a 'thing' – anything which can be described, imagined, whether real or fictional, present, past or future [ISOTC215b].

Acronym	Term	Meaning	Notes
	Conformity	Conformity is a term that encompasses both conformance and compliance. When applied to software systems, the term 'conformity' may be replaced with the term 'conformance', in accordance with common practice in the information technology industry. When applied to management and business processes, the term 'conformity' may be replaced with the term 'compliance'.	
	Conformity assessment	Demonstration that an object of assessment fulfils specified requirements.	
CTPP	**Containered Trade Product Pack**	A level of the AMT.	
	Cross map		See: Map.
	Cross map target		See: Map target.
	Data aggregation	A process by which information is collected, manipulated and expressed in summary form.	Data aggregation is primarily performed for reporting purposes, policy development, health service management, research, statistical analysis and population health studies [ISO18308]
DOHA	**Department of Health and Ageing**		
	Developer	A developer may be an organisation that develops a software product, or a provider of eHealth services. Health jurisdictions, healthcare providers and systems integrators may also be developers of eHealth systems.	

Acronym	Term	Meaning	Notes
	Equivalence	Like in significance or import; corresponding or identical in effect and function.	Synonym: • Semantic equivalence In controlled terminology: Two concepts are (semantically) equivalent if their domain of meanings overlap and their semantic definitions are interpreted as identical. That is, the total scope of meaning of each concept is the same and each concept is defined as the same thing [ISOTC215b].
GP	**General Practitioner**		
	Human mapping	The use of human knowledge and skill to build maps between concepts and/or terms in different coding systems.	Each map is built singly and individually. The process requires examination of each and every concept and coding system. Informed judgements or decisions are made about the shared meaning of concepts. Some electronic or computational tools are used, but only in support of work process: these are not helpful in determining any equivalence of meaning [NEHTA2005].
IS	**Information Systems**		
IT	**Information technology**		
ICU	**Intensive Care Unit**		
IHTSDO	**International Health Terminology Standards Development Organisation**		
ISO	**International Standards Organisation**		

Acronym	Term	Meaning	Notes
	Lexical match	Where two concepts are represented using the same word(s).	The source concept matches the target concept exactly; word for word, singular to singular, plural to plural. It must be noted that just because the source and target systems have matching words, does not mean that the meaning is exactly the same. For example: High blood pressure can mean a single instance of a high reading for an individual (which could have been after strenuous exercise), while high blood pressure can also be an ongoing condition. One meaning is far more clinically significant than the other.
	Map	An index from one term to another, sometimes using rules that allow translation from one representation to another indicating degree of equivalence.	Synonyms: • Individual map • Cross map
	Map source	A terminology, coding scheme or classification used as the starting point for map production (in the context of mapping).	
	Map table	The file containing multiple individual maps which has been developed for a specific purpose.	The map to AMT is a map table.
	Map target	A terminology, coding scheme or classification to which some or all of the concepts in another terminology, coding system or classification (the map source) are mapped.	Synonyms: • Target (in a map) • Target scheme Some map targets may be derived from two or more associated statements and in these cases the combination can be expressed as a set of associated rules. Each Map Target is represented as a row in the map. Source: Modified from IHTSDO – to be non SNOMED CT/US specific. [IHTSDO2009a].

Acronym	Term	Meaning	Notes
	Mapping	A process of defining a relationship between concepts in one coding system (Source) to concepts in another coding system (Target) in accordance with a documented rationale, for a given purpose.	Quality mapping will be useable, reproducible and understandable [ISOTC215b].
	Mapping specialist	An individual who is competent to determine whether a map concept within a source terminology has a link to a concept in the map target.	
MPP	**Medicinal Product Pack**	A level of the AMT.	
MPUU	**Medicinal Product Unit of Use**	A level of the AMT.	
MP	**Medicinal Product**	A level of the AMT.	
NCTIS	**National Clinical Terminology Information Service**		
NEHTA	**National E-Health Transition Authority**		
PCEHR	**Personally Controlled Electronic Health Record**		
	Reference set	A group of components (e.g. concepts, descriptions or relationships) that share a specified common characteristic or common type of characteristic.	Synonym: • Subset Note a reference set is a subset of the superset or complete terminology or classification [ISOTC215b].
	Scenario	The story based description of a situation or business instance that defines requirements, roles and processes for a given map. (Modified from [ISOTC215b].)	Synonym: • Use case It is preferred though that the term ‘use case’ be reserved for the IT-based representation of use cases and use case modelling.

Acronym	Term	Meaning	Notes
	Semantic match	Where two concepts represent the same meaning, even if the words used to describe them are different [ISOTC215b]. Semantic matching uses knowledge of meaning of the SNOMED CT concept and target ICD-10 code(s) to develop the map. For example, semantic matching may use knowledge of synonyms, knowledge of part or whole relationships, knowledge of class/subclass (parent/child, sub-type/super-type) relationships, and knowledge of the user's own information and realm of context to increase both recall and precision of matching choices [IHTSDO2009a].	
SNOMED CT-AU	**SNOMED CT Australian extension**	This includes complete content plus reference sets for use in Australia.	
SNOMED CT	**Systematized Nomenclature of Medicine: Clinical Terms**	This is considered to be the most comprehensive, multilingual clinical healthcare terminology in the world. SNOMED CT intellectual property rights were transferred to the SNOMED SDO® in the formal creation of the IHTSDO [IHTSDO2009a].	
TP	**Trade Product**	A level of the AMT.	
TPP	**Trade Product Pack**	A level of the AMT.	
TPUU	**Trade Product Unit of Use**	A level of the AMT.	