



**Clinical Terminology  
Guidance for Use in Healthcare Software v1.0**

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# Document information

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# 1 Introduction

## 1.1 Purpose

This document provides guidance for managing risks when implementing Australian Medicines Terminology (AMT) or the Systematized Nomenclature of Medicine, Clinical Terms<sup>®</sup> – Australian Release (SNOMED CT-AU)<sup>1</sup> in healthcare software. This guidance complements the software requirements provided by other eHealth specifications.

The clinical terminology guidance is provided to all software developers interested in incorporating AMT and SNOMED CT-AU into their software systems. They are *not* part of the set of software conformance requirements for healthcare software accessing the personally controlled electronic health (PCEHR) system; however, adoption of this clinical terminology guidance is strongly encouraged. More information about adoption of the clinical terminology guidance is provided in section 1.4.

## 1.2 Intended audience

This document is primarily directed towards:

- healthcare software vendors;
- vendors of proprietary clinical coding system products; and
- healthcare jurisdictions and healthcare providers.

## 1.3 Scope

This document is applicable to those organisations developing healthcare software systems that support terminology for use in an Australian context. This document deals with the use of terminology as a native interface terminology or through terminology mapping.

The guidance specifically deals with the use of terminology in a healthcare software system to enable clinical information to be retrieved, recorded, stored and displayed in a manner that reduces clinical safety risks and maximises the business benefits of using terminology.

This document does not attempt to address areas of terminology use related to clinical decision support, data aggregation, statistical analysis and reporting, and research. However, it does not restrict those implementing terminology for such purposes to adopt the guidance provided by this document. These areas may be covered in future versions of this document. Please contact the National Clinical Terminology and Information Service (NCTIS) for specific implementation guidance in these areas. Questions can be emailed to [help@nehta.gov.au](mailto:help@nehta.gov.au).

## 1.4 Conformance

Software developers may want to claim that their software implements this clinical terminology guidance. For such claims to be meaningful and for the healthcare community to have a shared understanding of these claims, the clinical terminology

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<sup>1</sup> IHTSDO®, SNOMED® and SNOMED CT® are registered trademarks of the IHTSDO.

guidance has been documented in the form of software requirements using the standard verbs **shall**, **shall not**, **should**, **should not** and **may**.

A software developer wanting to claim they have implemented the clinical terminology guidance must have software that implements all mandatory and applicable conditional requirements in this document. These are the requirements using the verbs **shall** and **shall not**.

## 1.5 Terminology adoption

The approach to terminology adoption may be different from one organisation to another, depending on the intent and the scope of each implementation. Table 1 identifies a number of use cases related to terminology adoption.

Note that this document uses the generic word *terminology* to refer to AMT and SNOMED CT-AU. Words such as *concept*, *concept identifier*, *description* and *preferred term* are used in the specific clinical terminological sense, unless otherwise specified. See page 42 for a list of terms and their meanings.

Table 1: Terminology adoption use cases

UC ID	Use case
UC.001	Organisation uses terminology release files, customised reference sets, custom subsets and intentional constraints as the basis for developing terminology maps
UC.002	Organisation develops a healthcare software system, allowing the use of terminology through mapping
UC.003	Organisation develops a healthcare software system, allowing the exchange of clinical information in messages or CDA clinical documents using terminology mapping. The organisation may or may not supply terminology as part of software releases
UC.004	Organisation integrates terminology maps into a healthcare software system
UC.005	Organisation uses terminology release files, customises reference sets, or creates custom subsets, intentional constraints or customised terminology descriptions for use as a native interface terminology
UC.006	Organisation develops a healthcare software system allowing the use of terminology as a native interface terminology. The organisation may or may not supply terminology as part of software releases
UC.007	Organisation develops a healthcare software system, allowing the exchange of clinical information in messages or CDA clinical documents using native interface terminology
UC.008	Organisation integrates terminology into the healthcare software system as a native interface terminology
UC.009	The delivery of healthcare is supported by the use of terminology either as a native interface terminology or through terminology maps in the healthcare software system

Healthcare software systems may adopt terminology as a native interface terminology or through terminology mapping, or both. Where the healthcare software system uses terminology both as a native interface terminology and through terminology mapping, all native interface terminology and terminology mapping requirements are applicable.

Organisations adopting terminology through terminology mapping should be aware of both the disadvantages (such as high maintenance overhead) and the advantages (such as allowing the use of existing coding systems) of using terminology in information exchange. Terminology maps in the healthcare software system need to be from a local or proprietary coding system (the source) to the terminology (the target).

Australian and international organisations developing healthcare software systems supporting terminology should be aware that, if their systems are intended for the Australian market or they wish to take part in Australia’s eHealth initiatives, the adoption of the Australian release of SNOMED CT-AU or AMT (or both) is recommended.

The healthcare software system may be a standalone application or may be a combination of integrated systems, including terminology browsers or terminology servers, or both. Terminology browsers allow the content and structure of terminology to be explored and viewed, whereas terminology servers provide programmatic access to terminology data. Regardless of implementation type, the guidance in this document apply to those healthcare software systems using AMT or SNOMED CT-AU (or both) in one way or another.

For more details on the implementation approaches, refer to the *SNOMED CT Technical Implementation Guide* [IHTSDO2014] and the *Australian Medicines Terminology v3 Model Technical Implementation Guide* [NEHTA2013b].

Table 2 outlines the different scenarios, and the scope relevant to the implementation for specific use cases.

*Table 2: Scope determination*

<b>Scenario</b>	Adopting terminology for use in the GUI (native interface terminology)	
<b>UC</b>	<b>Source</b>	<b>Scope of implementation</b>
UC.006	Section 2.1.1	All mandatory and relevant conditional requirements are mandatory.
UC.006	Section 2.1.2	All mandatory and relevant conditional requirements are mandatory.
UC.006	Section 2.1.3	If the healthcare software supports creating locally defined concepts (LDCs), or the recording of free text with concepts, then all conditional requirements are mandatory.  If the healthcare software supports the recording of free text instead of recording terminology, then the relevant optional requirements apply.

UC.007	Section 2.1, <i>Guidance for Use of Medical Nomenclatures in Information Exchange</i> [NEHTA2014b]	If the healthcare software system supports creating and sending messages or CDA documents, then all relevant conditional requirements are mandatory.
UC.007	Section 2.2, <i>Guidance for Use of Medical Nomenclatures in Information Exchange</i> [NEHTA2014b]	If the healthcare software system supports receiving messages or CDA documents, then all relevant conditional requirements are mandatory.

**Scenario:** Adopting terminology through mapping (terminology mapping)

<b>UC</b>	<b>Source</b>	<b>Scope of implementation</b>
UC.002	Section 2.2.1	All mandatory and relevant conditional requirements are mandatory.
UC.002	Section 2.2.2	All mandatory and relevant conditional requirements are mandatory.
UC.003	Section 2.1, <i>Guidance for Use of Medical Nomenclatures in Information Exchange</i> [NEHTA2014b]	If the healthcare software system supports creating and sending messages/CDA documents, then all relevant conditional requirements are mandatory.
UC.003	Section 2.2, <i>Guidance for Use of Medical Nomenclatures in Information Exchange</i> [NEHTA2014b]	If the healthcare software system supports receiving messages/CDA documents, then all relevant conditional requirements are mandatory.

**Scenario** Adopting terminology through native interface terminology implementation and terminology mapping

<b>UC</b>	<b>Source</b>	<b>Scope of implementation</b>
UC.006	Sections 2.1.1 and 2.1.2	All mandatory and relevant conditional requirements are mandatory.
UC.006	Section 2.1.3	If the healthcare software supports creating LDCs, or the recording of free text with concepts, then all conditional requirements are mandatory. If the healthcare software supports the recording of free text instead of recording terminology, then the relevant optional requirements apply.
UC.002	Sections 2.2.1 and 2.2.2	All mandatory and relevant conditional requirements are mandatory.

UC.003 UC.007	Section 2.1, <i>Guidance for Use of Medical Nomenclatures in Information Exchange</i> [NEHTA2014b]	If the healthcare software system supports creating and sending messages or CDA documents, then all relevant conditional requirements are mandatory.
UC.003 UC.007	Section 2.2, <i>Guidance for Use of Medical Nomenclatures in Information Exchange</i> [NEHTA2014b]	If the healthcare software system supports receiving messages or CDA documents, then all relevant conditional requirements are mandatory.

## 1.6 Related documents

Table 3 outlines the related terminology resources.

*Table 3: Related documents*

<b>Document title</b>	<b>Description</b>
1 <i>Clinical Terminology – Guidance for People and Processes</i> [NEHTA2014a]	Describes the guidance for people and processes when adopting AMT and SNOMED CT-AU.
2 <i>Clinical Terminology – Tests for Use in Healthcare Software</i> [NEHTA2014d]	Describes the test cases for testing adherence to the guidance for use of AMT and SNOMED CT-AU in healthcare software.
3 <i>Clinical Terminology – Guidance for Use of Medical Nomenclatures in Information Exchange</i> [NEHTA2014b]	Describes the guidance for the use of medical nomenclatures in clinical messages and CDA documents.
4 <i>Clinical Terminology – Tests for Use of Medical Nomenclatures in Information Exchange</i> [NEHTA2014i]	Describes the test cases for testing adherence to the guidance for use of medical nomenclatures in clinical messages and CDA documents.
5 <i>AMT Mapping Guidelines</i> [NEHTA2012a]	Describes a mapping methodology for mapping local and proprietary coding systems to AMT.
6 <i>SNOMED CT-AU Mapping Guidelines</i> [NEHTA2014h]	Describes a mapping methodology for mapping local and proprietary coding systems to SNOMED CT-AU.
7 <i>Australian National Terminology Release Licence Agreement</i> [NEHTA2009]	Details the terms the licence holder must comply with.
8 <i>SNOMED CT Affiliate License Agreement</i> [IHTSDO2009]	Details the terms the licence holder must comply with.

## 1.7 Development of clinical terminology guidance

The guidance has been derived from:

- Implementation and user guides for the SNOMED CT international release by the International Health Terminology Standards Development Organisation (IHTSDO) [IHTSDO2014];
- SNOMED CT-AU resources published by the NCTIS [NEHTA2014e], [NEHTA2014h];
- AMT resources published by the NCTIS [NEHTA2012b], [NEHTA2013a], [NEHTA2013b], [NEHTA2014f];
- HL7 Clinical Document Architecture, Release 2, HL7 Version 3 Standard, 2004 Health Level Seven, Inc. [HL72004];
- NEHTA clinical document specifications<sup>2</sup> and implementation guidance [NEHTA2013c];
- Microsoft Health Common User Interface guidelines [Microsoft2010a], [Microsoft2010b]; and
- Clinical safety risks assessments.

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<sup>2</sup> Available from <http://www.nehta.gov.au/implementation-resources/clinical-documents>

## 2 Terminology software requirements

### 2.1 Native interface terminology implementation

The requirements in this section only apply to healthcare software systems that support the use of AMT or SNOMED CT-AU through a graphical user interface (GUI) for accessing, recording, storing, and displaying clinical information.

Requirements listed as mandatory must be supported by the software. Conditional requirements are treated as mandatory, provided the condition stated in the requirement is satisfied. Recommended requirements are optional, but strongly encouraged.

#### 2.1.1 Access to terminology

##### 020615 Terminology information

The healthcare software system **shall** store or have access to the following information:

- The date or version of the terminology release currently in use by the healthcare software system; and
- The coding system indicator.

**Priority** Mandatory

##### Additional Notes

The healthcare software system needs to be aware of this information to support ongoing updates of the terminology content.

The information is either stored in the healthcare software system or in another location, accessible by the healthcare software system. This requirement does not restrict the use of terminology servers.

The coding system indicator refers to information allowing the coding system to be identified. To identify the coding system, the following options are available:

- Unique coding system namespace;
- The SNOMED CT-AU OID ("2.16.840.1.113883.6.96");
- The AMT version 3 OID ("2.16.840.1.113883.6.96"), (same as SNOMED CT-AU);
- The AMT version 2 OID ("1.2.36.1.2001.1004.100");
- The HL7 v2 table 396 code "SCT" for SNOMED CT-AU;
- The HL7 v2 table 396 code "AMTv2" for AMT version 2; or
- The HL7 v2 table 396 code "SCT" for AMT version 3.

**020616 Terminology reference data**

As a minimum, the healthcare software system **shall** store or have access to all content or a custom subset of the content in the following terminology release files published by the NCTIS:

- A terminology concept file containing clinical concepts that make up AMT or SNOMED CT-AU;
- A terminology description file containing terminology descriptions that give the most clinically appropriate way of expressing a concept and provide a well-understood and standard way of referring to a terminology concept;
- Applicable terminology reference set files.

**Priority**            Mandatory

**Additional Notes**

These are the minimum set of files needed to use AMT or SNOMED CT-AU effectively.

Additional release files, such as the terminology relationship file containing links between terminology concepts, are highly desirable and are important for more advanced uses of terminology.

In each release file, there are a number of data components that must be supported by the healthcare software system (e.g. a value labelled as *id* in the terminology concept file is referred to as the concept identifier in this document). Other data components (e.g. labelled as *effectiveTime*, *sourceId*, *active*, *typeId*, *DescriptionStatus*, *referencedComponentId*, *AcceptabilityValue*, *referencedComponent*, *ConceptStatus*), may either be required or optional, depending on the scope and purpose of terminology in the healthcare software system as well as the terminology integration or maintenance approach.

The terminology release files can be imported directly into a database schema that matches the distribution file specification. This data then provides the core resource for the healthcare software system. This direct use of distributed files in a relational database has the advantage of allowing simple integration. However, it may not be the most efficient approach in terms of performance or data storage overhead. Some healthcare software systems require relatively complex queries and need to be completed in fractions of a second to provide an acceptable user interface [IHTSDO2014]. There is no requirement to use the data structure as distributed.

Although the primary distribution format is relational, this does not require healthcare software systems to use a relational database as the primary or only storage format. The requirements may also be met by representing some or all of the distributed data in other forms, including object-oriented databases, Extensible Mark-up Language (XML) or proprietary data structures. These structures may be used separately or, in some cases, in combination with a relational database [IHTSDO2014].

System designers and developers, therefore, need to provide a solution that supports the context in which the healthcare software system will be used.

**020617      Accessing new terminology releases**

The healthcare software system **shall** enable new terminology releases to be imported.

**Priority**      Mandatory

**Additional Notes**

The terminology content is updated and released routinely by the NCTIS. The conditions in the licence agreements require new versions of SNOMED CT-AU and AMT to be adopted within 180 days of release (NEHTA reserves the right to vary the terms of this agreement). Therefore, the system needs to support the upload of a new release so that the existing content in the system can be updated in compliance with the licence conditions.

This requirement does not mandate a specific approach to importing terminology data into the healthcare software system. For more guidelines on implementation and maintenance models, please refer to the *SNOMED CT Technical Implementation Guide* [IHTSDO2014] and the *Australian Medicines Terminology v3 Model Technical Implementation Guide* [NEHTA2013b].

## 2.1.2 Recording, storage and display of clinical information

### 020622 Modification of terminology descriptions is not allowed

The healthcare software system **shall not** allow the user to modify terminology descriptions (i.e. preferred terms) displayed in the GUI for recording and storing.

**Priority** Mandatory

#### Additional Notes

The intent of this requirement is to reduce the risk of the healthcare software system incorrectly recording, storing and displaying terminology concepts. Storing the modified terminology description as if it is the concept's preferred term (as per the NCTIS release), while maintaining a reference to the corresponding concept identifier is prohibited. Subsequent display of such modified text will result in the user not being aware of the distinction between the original terminology description and the modified text, leading to a false representation of the terminology concept.

This requirement does not restrict user-entered free text from being recorded in the terminology-enabled data field.

The integrity of the terminology must be maintained in local systems as distributed by the NCTIS; that is, the association between terminology concept identifiers and terminology descriptions must not be edited or distorted.

Where users find the available set of terminology concepts in the GUI limits their ability to record clinical statements as intended, the healthcare software system should allow users and implementers to perform the following in order of precedence:

- Revision of constraints imposed upon the relevant data fields; i.e. redefining or refining the scope of terminology reference sets, custom subsets, intentional constraints;
- An ability to migrate to the most recent terminology release;
- Record user-entered free text (original text) instead of recording the terminology concept; or
- Use LDCs.

If users find that the latest terminology release data does not support the ability to author appropriate clinical statements, it is recommended that users contact the NCTIS to request an update to the terminology release data to address identified gaps. The use of LDCs should only be treated as an interim strategy to address the gap in the terminology release data until the NCTIS is able to assess whether it is appropriate to issue an update. Implementers should be aware that there are rules regarding the creation of LDCs, as defined in *Clinical Terminology - Guidance for People and Processes* [NEHTA2014a].

**Related requirements** 020620, 020633

**020623      Storing the original text as seen by the user at the time of recording the concept**

The healthcare software system **shall** store the original text for each clinical statement, as seen by the user recording the information, as part of the clinical record.

**Priority**      Mandatory

**Additional Notes**

This requirement is based on IHTSDO's *SNOMED CT Technical Implementation Guide* [IHTSDO2014], and the *Australian Medicines Terminology v3 Model Technical Implementation Guide* [NEHTA2013b].

If the user recorded a terminology concept through the selection of a terminology description displayed in the GUI, then the description is to be stored as the original text as part of the clinical record.

For all other cases, including post-coordinated expressions, the text seen by the user recording the clinical statement is to be stored as the original text, as part of the clinical record.

**020625 Storing valid post-coordinated expressions**

If the healthcare software system supports the use of terminology post-coordinated expressions for recording and storing clinical statements, it **shall** allow the user to record and store only those post-coordinated expressions that:

- Are in close-to-user form; and
- Do not violate the SNOMED CT compositional grammar [IHTSDO2014]; and
- Do not violate the SNOMED CT concept model [IHTSDO2014] or AMT v2 concept model [NEHTA2012b] or AMT v3 concept model [NEHTA2013b].

**Priority** Conditional

**Additional Notes**

The intent of this requirement is to avoid terminology post-coordinated expressions written by the user or generated by the healthcare software system that are nonsensical or contradictory in nature, reducing the risk of misinterpreting clinical statements or using incorrect statements in making clinical decisions.

The SNOMED CT compositional grammar by IHTSDO provides syntax for describing the SNOMED CT post-coordinated expressions in a standardised machine-processable format [IHTSDO2014]. This syntax needs to be followed to ensure that post-coordinated expressions are valid syntactically as well as semantically. AMT must comply with the same rules. These rules may evolve or additions may be introduced over time, in which case healthcare software systems need to be updated.

When available, the AMT and SNOMED CT machine-readable concept models will provide mechanisms through which a healthcare software system can verify that a post-coordinated expression is semantically valid. Without these machine-readable concept models, and a compositional grammar machine parser, the healthcare software would not be able to ensure that the post-coordinated expression is correct.

Transforming a post-coordinated expression to a normal form may be necessary to support effective data retrieval. However, even minor corrections to the definition of a concept in future releases may significantly alter the resulting normal form of the same expression. Therefore, it is required that the primary or original expression be stored, using the representation that is as close as possible to the form in which it was recorded; that is, close-to-user form [IHTSDO2014].

**020624 Storing customised terminology descriptions**

If the healthcare software system supports customised terminology descriptions (CTDs), and it displays those descriptions in the GUI to the user for recording and storing, it **shall** store the original text (i.e. CTD) as well as the terminology concept identifier, and terminology description (i.e. preferred term) along with the terminology release date/version, or a reference to the terminology release version stored elsewhere.

**Priority** Conditional

**Additional Notes**

The intent of this requirement is to ensure that the original meaning of the clinical statement is maintained where the healthcare software system supports customised terminology descriptions.

**Related requirements** 020622, 020623

## **020626 Storing terminology concepts**

Where the healthcare software system displays terminology descriptions in the GUI to the user for recording and storing a clinical statement, it **shall** store the terminology concept identifier and terminology description (i.e. preferred term), original text (i.e. preferred term) along with the terminology release version or a reference to the terminology release version stored elsewhere.

**Priority** Mandatory

### **Additional Notes**

This requirement is based on the IHTSDO guidelines on SNOMED CT implementation [IHTSDO2014]. The intent of this requirement is to allow the healthcare software system to store the terminology release version along with the terminology concept identifier and terminology description, allowing traceability to the release that the healthcare software system was using at the time of data entry.

This requirement applies where the terminology description was displayed in the GUI and stored as the clinical statement. The approach in storing terminology in the healthcare software system will determine if the original text is the terminology description (i.e. preferred term) or if it is an exact copy of the terminology description stored in an additional field, in the data store.

The terminology concept identifier, description and version details to be stored must come from the most recent release of the terminology release version implemented in the healthcare software system, and must meet the conditions in the licence agreements that require new versions of SNOMED CT-AU and AMT to be adopted within 180 days of release by the NCTIS. However, NEHTA reserves the right to vary the terms of this agreement.

## **020627 Storing post-coordinated expressions**

If the healthcare software system supports the use of terminology post-coordinated expressions for recording and storing clinical statements, it **shall** store the recorded post-coordinated expression and the original text as well as the terminology release version or a reference to the version stored elsewhere. Where a post-coordinated expression does not conform to the SNOMED CT compositional grammar [IHTSDO2014] or violate the relevant concept model, the healthcare software system **shall** store only the original text.

**Priority** Conditional

### **Additional Notes**

The intent of this requirement is to fully capture the meaning intended by the user who entered the expression in a standardised machine-processable format. This is also to provide traceability to the release that the healthcare software system was using at the time of data entry.

For all post-coordinated expressions, the text seen by the user recording the expression is to be stored as original text. Healthcare software systems not capable of validating post-coordinated expressions are required to store and display the original text only.

The relevant concept model used by the healthcare software system in validating the post-coordinated expression is determined by the use of AMT or SNOMED CT-AU. For further details refer to the SNOMED CT concept model [IHTSDO2014] or AMT v2 Model concept model [NEHTA2012b] or AMT v3 concept model [NEHTA2013b].

**020628 Display active terminology concepts**

The terminology descriptions displayed to the user for the purpose of recording and storing clinical statements **shall** be active terminology concepts only.

**Priority** Mandatory

**Additional Notes**

This requirement is based on the IHTSDO guidelines on SNOMED CT implementation [IHTSDO2014]. The intent of the requirement is to reduce the risk of recording retired, erroneous or ambiguous concepts in a patient record.

**Related requirements** 020634

**020659 Display terminology descriptions without identifiers**

Where the healthcare software system displays terminology concepts to the user, identifiers such as terminology description identifiers or terminology concept identifiers **shall not** be displayed.

**Priority** Mandatory

**Additional Notes**

This requirement is based on the IHTSDO guidelines on SNOMED CT implementation [IHTSDO2014].

The sequence of digits in a terminology concept identifier or terminology description ID do not convey any information about the meaning or nature of the terminology concept and do not add any value in its presentation to users.

**020629 Display of SNOMED CT-AU and AMT version 3 terms**

If the healthcare software system displays SNOMED CT-AU or AMT version 3 terminology descriptions, other than CTDs, in the GUI for recording and storing clinical statements, it **shall** only display the preferred terminology descriptions from the *Australian dialect* reference set.

**Priority** Conditional

**Additional Notes**

A dialect reference set is needed as terminology descriptions are only accessible via a language or dialect reference set [NEHTA2014e]. The *Australian dialect* reference set provides the preferred terms relevant to the Australian eHealth environment [NEHTA2014e].

This requirement is not relevant for those terminology concepts displayed in the GUI that have been assigned CTDs.

**020630      Display of AMT version 2 terms**

If the healthcare software system displays AMT version 2 terminology descriptions, other than CTDs, in the GUI for recording and storing clinical statements, it **shall** only display the preferred terminology descriptions.

**Priority**      Conditional

**Additional Notes**

The intent of this requirement is to ensure that systems display AMT descriptions that are classified as preferred terms. Preferred terms are intended to capture the common word or phrase used by Australian clinicians [NEHTA2014f].

Organisations should be aware that AMT version 2 is no longer being maintained.

This requirement is not relevant for those terminology concepts displayed in the GUI that have been assigned CTDs.

**020618      Constraining terminology content for data entry**

For each terminology-enabled data field, only those terminology concepts, including CTDs belonging to one or more relevant reference sets, subsets or intentional constraints **shall** be made available to the user for recording.

**Priority**      Mandatory

**Additional Notes**

The intent of this requirement is to reduce the risk of allowing invalid terminology concepts to be recorded in a data field and to increase the possibility of finding the correct terminology concept.

'Intentional constraints' imposed on a particular terminology-enabled data field refers to measures taken by system designers, developers and terminology data implementers in allowing only certain active terminology concepts, meeting certain criteria or falling under a particular conceptual category, to be available for recording and storing by the user. For example, if a data field captures clinical procedures, displayed to the user as a list of allowable descriptions, it would only display terminology concepts belonging to the SNOMED CT-AU *Procedure foundation* reference set and would not display terminology concepts from the *Problem/diagnosis* reference set.

Other intentional constraints may be configurable and are applied at runtime and these require greater flexibility in the software design. Several types of configurability may be applied. These range from installation configuration to context-specific dynamic configuration. Refer to the *SNOMED CT Technical Implementation Guide* for more information [IHTSDO2014].

The terminology concepts made available through a terminology-enabled data field are determined purely by the scope and purpose of that particular data field. It is therefore acceptable to allow access to one or more reference sets within a single terminology or across multiple terminologies, whichever addresses the need. For example, a terminology-enabled data field intended to record substance/agents causing adverse reactions in patients may constrain access to both the SNOMED CT-AU *Adverse Reaction Agent* reference set and the AMT *Trade Product Pack* reference set.

With appropriately designed data fields and appropriately constrained terminology data, terminology data implementers can limit the risk of users not being able to find the most appropriate terminology concepts to express clinical statements. Not limiting this risk may result in the user selecting an inferior or incorrect concept to express a clinical statement. It is therefore important that those responsible for designing the software and those responsible for constraining and integrating terminology data into the healthcare software system work closely to ensure the correct balance is struck between logical software designs and appropriate aggregation of terminology data.

Therefore, a systematic and carefully planned approach to selecting terminology references sets and refining and developing custom subsets, intentional constraints and CTDs is needed by the organisation responsible for the manipulation, refinement and integration of terminology data into the healthcare software system. The healthcare software system must be tested for accuracy, usability and clinical correctness end-to-end across all workflows, once implemented in the healthcare software system for each release or revision.

Please refer to *Clinical Terminology - Guidance for People and Processes* [NEHTA2014a] for more details on necessary mitigation strategies and development approaches.

**020632          Alternative means to view the full description, CTD, LDC or expression not fully visible**

The healthcare software system **shall** allow an alternative means for the user to view the full text of the terminology description, CTD, LDC or expression where not fully visible in the GUI.

**Priority**          Mandatory

**Additional Notes**

This requirement applies to the display of terminology descriptions for the selection and storage of terminology concepts, CTDs, LDCs and post-coordinated expressions in the healthcare software system, as well as displaying such descriptions and expressions previously stored.

The intent of this requirement is to reduce the risk of selecting and storing terminology descriptions, CTDs, LDCs or post-coordinated expressions that are not fully visible to the user. It also reduces the risk of making clinical decisions based on clinical statements not fully visible in the GUI.

Some clinical statements may not be displayed in their entirety to the user as a result of limitations of the functionality of the system's GUI. For example, in most cases dropdown list controls are defined with a fixed width to avoid variations in size based on the length of the item text and to ensure that controls fit within the limitations of the GUI's dimensions. With some AMT descriptions exceeding 300 characters and SNOMED CT-AU descriptions exceeding 225 characters, it is important that healthcare software systems provide alternative means of viewing the entire clinical statement and provide cues for the user that the clinical statement is not fully visible.

**Related requirements** 020633

**020633 Long text**

Terminology descriptions, CTD, LDC and post-coordinated expressions displayed to the user **shall** be accompanied by a visual cue where the text displayed is not fully visible to the user.

**Priority** Mandatory

**Additional Notes**

This requirement applies to the display of terminology descriptions for the selection and storage of terminology concepts, CTDs, LDCs or post-coordinated expressions in the healthcare software system as well as displaying terminology descriptions or post-coordinated expressions previously stored.

The intent of this requirement is to reduce the risk of misinterpreting the meaning intended by the user who entered the clinical statement.

Some clinical statements may not be displayed in their entirety to the user as a result of length of the clinical statement and limitations of the functionality of the system's GUI. For example, in most cases dropdown list controls are defined with a fixed width in order to avoid variations in width based on the length of the item text and to ensure controls fit within the limitations of the GUI's dimensions. With some AMT descriptions exceeding 300 characters and SNOMED CT-AU descriptions exceeding 225 characters, it is important that healthcare software systems provide alternative means of viewing the entire clinical statement and cues to the user that the clinical statement is not fully visible.

Visual cues may include one or more of the following to indicate that the text is not fully visible [Microsoft2010b]:

- Software controls:
  - scroll bars;
  - markers, labels, symbols, icons or flags at the end or adjacent to the text not fully visible.
- Sequence of text characters at the end of the visible text:
  - '...>>'
  - '\*... /'
  - '...' etc.

It is important to note the approach adopted should not indicate that the hidden text is assumed to be unimportant [Microsoft2010b].

To mitigate the risk that the user may not notice the cue, the healthcare software system should use style changes to emphasise it visually. For example, by using bold font or an alternative colour from normal colour patterns.

**Related requirements** 020632

**020660      Display of additional concept details where the terminology description or CTD is not unique**

The healthcare software system **shall** clearly flag or indicate to the user those terminology descriptions, CTDs and LDC descriptions that are synonymous within the available list of concepts for a particular data field. The healthcare software system **shall** allow the user to access at least one of the following for each of those descriptions:

- The fully specified name (FSN) of the terminology concept;
- The position of the terminology concept within terminology hierarchy;
- The position of the terminology concept, associated with the CTD, within terminology hierarchy; or
- The terminology concept's preferred term (in the case of a CTD).

**Priority**      Mandatory

**Additional Notes**

The intent of this requirement is to reduce the risk of recording incorrect clinical statements that may be used in making clinical decisions regarding a person's healthcare.

The term 'synonymous' in the context of this requirement refers to descriptions with the same text, independent of case and punctuation. It also refers to descriptions with similar or the same meaning, look-alike or sound-alike. For example, 'fit' meaning a state of being healthy and 'fit' meaning a seizure.

Allowing access to additional information on synonymous concepts may be achieved by using a tooltip, an infotip, an additional label, an additional text field, fly-out text box, a balloon, a link or a popup window. These are only examples and system designers may follow alternative approaches to meet this requirement.

The identification or flagging of such concepts may be achieved through one or more approaches, including the use of icons, character text in front of the description (e.g. '[!]) [Microsoft2010b], alternative font colours, or by allowing access to the additional information, as long as the approach is clear to the user.

If the existence of synonymous concepts in a list is easily avoided by changing the search criteria, the healthcare software system may suggest alternative key words that could alter the number of duplicates displayed to the user [Microsoft2010b]. This approach should be adopted if it is intuitive.

In addition to these approaches, software designers, developers and terminology data implementers may introduce additional mitigation controls so that users are made aware of the difference between synonymous descriptions, such as:

- Grouping by categories (e.g. generic names are listed before brand names for AMT concepts);
- Prioritising concepts (e.g. most commonly used concepts displayed first) [Microsoft2010a].

With appropriately constrained data fields, system designers and terminology data implementers can limit the cases where multiple terminology descriptions, CTDs and LDC descriptions are displayed to the user for a particular data field. Therefore, a systematic and carefully planned approach in selecting terminology references sets, and refining and developing customs subsets, intentional constraints and CTDs is needed by the organisation responsible for the manipulation, refinement and integration of terminology data into the healthcare software system. The healthcare software system must be tested for accuracy, usability and clinical correctness, end-to-end across all workflows, once implemented in the healthcare software system for each release or revision.

It may be difficult in some cases to designate constrained terminology release data to a

particular data field without encountering similar descriptions that could cause confusion. The introduction of CTDs or LDCs may increase the likelihood of this, which will then impact system usability and the risk of recording clinical statements that are misleading or ambiguous.

CTDs are required to undergo a premeditated development process for the purpose of meeting specific usages and care must be taken not to replace or modify the terminology release in any way. The outcome of this development process is that each CTD semantically matches a terminology description in the NCTIS release and therefore does not differ in meaning from the terminology concept it describes. The development of CTDs must not be based on other terminology synonyms (i.e. preferred or acceptable terms) as this may result in deviating from the true meaning of the terminology concept. Instead the terminology's FSN must be used in developing a new CTD for a terminology concept.

Please refer to *Clinical Terminology - Guidance for People and Processes* [NEHTA2014a] for more details on the necessary mitigation strategies needed to limit synonymous terminology descriptions and CTDs in data fields.

#### **020634 Display of inactive terminology concepts**

The healthcare software system **shall** be able to display clinical statements, including post-coordinated expressions that consist of inactive terminology concepts, when viewing historical patient records.

**Priority** Mandatory

#### **Additional Notes**

The intent of this requirement is to avoid loss of patient health history as a result of healthcare software systems being incapable of displaying terminology concepts that have been made inactive or retired since the time they were recorded.

There are different approaches to displaying historical patient information. This requirement does not suggest a particular solution design. However, designers and terminology data implementers should be aware that particular approaches may have an impact on how terminology releases will be maintained in the healthcare software system and how historical data will be displayed. The *SNOMED CT Technical Implementation Guide* [IHTSDO2014] provides guidance on different approaches in storage, retrieval and maintenance of terminology data.

**Related requirements** 020628

**020635      Displaying stored terminology concepts**

The healthcare software system **shall** display the original text (i.e. preferred term) of the stored terminology concept originally displayed to the user at the time of storing the clinical statement.

**Priority**      Mandatory

**Additional Notes**

The intent of this requirement is to reduce the risk of misinterpreting the meaning intended by the user who entered the concept. This requirement applies where the terminology description was displayed in the GUI, recorded and stored as the clinical statement. The approach in storing terminology in the healthcare software system will determine if the original text is treated as the terminology description (i.e. preferred term) or if it is an exact copy of the terminology description stored separately.

The healthcare software system displaying the clinical statement may not necessarily be the same system that recorded and stored the clinical statement.

**Related requirements** 020623, 020626

**020636      Displaying stored post-coordinated expressions**

The healthcare software system **shall** display for each stored post-coordinated expression, the exact text (i.e. original text) seen by the user at the time of storing the clinical statement.

**Priority**      Mandatory

**Additional Notes**

The intent of this requirement is to reduce the risk of misinterpreting the meaning intended by the user recording the expression. The original text is the same as the text seen by the user at the time of recording the expression.

The healthcare software system displaying the clinical statement may not necessarily be the same system that recorded and stored the clinical statement.

**Related requirements** 020623, 020627

**020662      Displaying stored customised terminology descriptions**

The healthcare software system **shall** display the CTD, as the original text, originally displayed to the user at the time of storing the clinical statement.

**Priority**      Mandatory

**Additional Notes**

The intent of this requirement is to reduce the risk of misinterpreting the meaning intended by the user who recorded the terminology concept.

This requirement applies where the CTD was displayed in the GUI, recorded and stored as the clinical statement.

The healthcare software system displaying the clinical statement may not necessarily be the same system that recorded and stored the clinical statement.

**Related requirements** 020623, 020624

**022519      Displaying terminology descriptions in addition to the original text**

Where the original text is different from the terminology description of a stored clinical statement, the healthcare software system **may** display the terminology description, along with the original text.

**Priority**      Optional

**Additional Notes**

The intent of this requirement is to give users viewing recorded clinical statements a better understanding of the original intent of the author at the time of recording the clinical statement.

Whether this requirement is relevant depends on the particular approach the healthcare software system uses in allowing clinical statements to be authored as well as the approach in storing and accessing terminology data. This requirement is not relevant where the terminology description was displayed in the GUI to the user and stored (see requirement 020635).

The terminology description needs to be displayed with the original text when a clinical statement is displayed to the user and processed by decision support algorithms. Displaying the terminology description allows the user to have a better understanding of what the healthcare software system is basing its decision support on, while appreciating the intended meaning of the author by considering the original text.

**Related requirements** 020636, 020621, 020661, 020662, 022521

**022521**      **Clear distinction between the terminology description and original text**

If the healthcare software system displays a terminology description with the original text of a stored clinical statement, it **shall** clearly indicate to the user the distinction between the original text and the terminology description.

**Priority**      Conditional

**Additional Notes**

The intent of this requirement is to ensure the interpretation of clinical statements is unambiguous and does not cause confusion.

**Related requirements** 020636, 020621, 020661, 020662, 022519

**020637**      **Allow search and filtering of terminology data fields**

The healthcare software system **should** allow the user to group, sort, filter and search terminology concepts and CTDs within the relevant reference sets, custom subsets and intentional constraints designated for that particular data field.

**Priority**      Recommended

**Additional Notes**

The intent of this requirement is to reduce the risk of not finding the relevant concept resulting in the selection of a less appropriate or irrelevant concept. The requirement allows the ability to reduce the number of concepts displayed for selection. A grouping, sort, search or filter function on a data field containing large numbers of concepts will allow the user to narrow down to a set of most relevant concepts.

Effective implementation of terminology depends on the speed and simplicity with which users can locate the concepts that they wish to use. A busy clinical user may become discouraged if the content they need cannot be quickly located when they search using familiar words or phrases. This could lead to the user not recording a terminology concept or not recording anything at all. For more guidance on implementing search and filtering, refer to the *SNOMED CT Technical Implementation Guide* [IHTSDO2014].

For more information on various techniques to implement effective search and filtering capability, refer to Section 4.4 in the *Australian Medicines Terminology v3 Model Technical Implementation Guide* [NEHTA2013b].

**Related requirements** 022520, 022528, 022529, 022530, 022531

**022520 Progressive searching**

The healthcare software system **should** allow the user to perform progressive searching on all relevant terminology-enabled data fields at the time of recording and storing a clinical statement.

**Priority** Recommended

**Additional Notes**

The intent of this requirement is to reduce the risk of not finding the most relevant concept or selecting an irrelevant concept from a large set of available descriptions displayed to the user in the GUI. This requirement is derived from Microsoft Health Common User Interface guidelines on searching [Microsoft2010a].

**Related requirements** 020637

**022528 Avoid default or auto-fill matches in data fields during searching**

If the healthcare software system supports searching, it **shall not** default or auto-fill the data field with a matching description while the user is entering text.

**Priority** Conditional

**Additional Notes**

The intent of this requirement is to reduce the risk of using irrelevant or incorrect clinical information clinical information to make clinical decisions regarding a person's healthcare because an irrelevant or incorrect concept was recorded. This requirement is derived from Microsoft Health Common User Interface guidelines on searching [Microsoft2010a].

**Related requirements** 020637, 022520

## **022529 Search techniques**

The healthcare software system **should** support a search functionality that performs a search on all acceptable synonyms, including preferred terms for each terminology concept belonging to the relevant reference sets, custom subsets or intentional constraints imposed on a particular data field. One or more of the following search techniques **should** be used:

- Partial word searching, including acronyms and abbreviations accountability;
- Word-order tolerant searching;
- Stemming;
- Excluded words searching.

**Priority** Recommended

### **Additional Notes**

The intent of this requirement is to allow users to more reliably find the most relevant terminology concepts through searching.

It is important that requirements 020629 and 020630 are still adhered to when implementing this requirement.

For more information on the search techniques, refer to the *SNOMED CT Technical Implementation Guide* [IHTSDO2014], the *Australian Medicines Terminology v3 Model Technical Implementation Guide* [NEHTA2013b] and the Microsoft Health Common User Interface design guidelines [Microsoft2010a].

**Related requirements** 020637

## **022530 Indicating the available set of concepts for recording and storing is incomplete**

Where the complete set of terminology descriptions and CTDs designated for a particular data field is not displayed to the user at the time of recording and storing a clinical statement, the healthcare software system **shall** clearly indicate this to the user, so that the user can take appropriate action to access the entire set of concepts if required.

**Priority** Mandatory

### **Additional Notes**

The intent of this requirement is to reduce the risk of the user selecting a less relevant or irrelevant concept, or recording free text because the complete set of concepts is not readily available for selection.

**Related requirements** 020637, 022531

**022531 Ability to reset constraints imposed on a data field**

Where a limited set of terminology concepts and CTDs displayed to the user is a result of a grouping, filter or search operation performed on the particular data field, the healthcare software system **shall** allow a mechanism for the user to remove such constraints, re-establishing access to the complete set of relevant terminology concepts and CTDs.

**Priority** Mandatory

**Additional Notes**

The intent of this requirement is to reduce the risk of the user selecting a less relevant or irrelevant concept, or recording free text because the complete set of concepts is not readily available for selection.

**Related requirements** 022530

### 2.1.3 Special cases

The requirements in this section refer to the use of healthcare software system capabilities under special circumstances. Although healthcare software systems may be designed with these behaviours, organisations and clinical users should not consider these behaviours to be the norm.

#### **020621 Recording and storing of user-entered free text and terminology concepts with a distinction**

If the healthcare software system allows the user to record and store user-entered free text with a reference to a recorded terminology concept or CTD (e.g. where the terminology description and free text constitutes a clinical statement), it **shall** store the clinical statement in such a manner that the user-entered free text is readily distinguishable from the terminology concept, so that the underlying meaning remains clear to those viewing the stored clinical statement.

**Priority** Conditional

#### **Additional Notes**

The intent of this requirement is to reduce the risk of the healthcare software system incorrectly recording clinical statements where no clear distinction can be made between the terminology concept and user-entered free text, and where the resulting clinical statement leads to a false representation of the underlying terminology concept originally selected by the user. This requirement also aims to maintain the integrity of terminology in local systems; that is, the association between terminology concepts, concept identifiers, and terminology descriptions will not be edited or distorted in use. It is prohibited to edit a terminology description while it remains linked to its associated concept identifier [NEHTA2013b].

It does not restrict user-entered free text from being recorded in the same terminology-enabled data field where the terminology concept was recorded, but it might be technically difficult to implement; that is, it might be difficult to reliably maintain a distinction between the user-entered free text and the terminology description while ensuring the terminology description is not altered (refer to requirement 020622).

This requirement is more relevant where the healthcare software system provides two data fields to record a single clinical statement. For example, the user records a medical disorder by selecting the terminology concept 'Cerebral arterial aneurysm' from a list of terminology descriptions displayed in the terminology-enabled data field. The user wants to add additional information and records 'minimum deficit' in the second data field supporting free text. In this case the healthcare software system stores the terminology concept and the user-entered free text separately and does not incorrectly combine the two fields during storage, so that a new description is created (e.g. 'Cerebral arterial aneurysm minimum deficit'). If the subsequent display of the clinical statement is within the same GUI, the terminology description and user-entered free text should be displayed as seen at the time of recording the clinical statement. The original text in this case would be the contents of the two data fields. If displayed through an alternative medium, the clinical statement must still convey the original meaning.

**NOTE:** Although this requirement suggests it might be an option for the healthcare software system to allow users to record a clinical statement, constituting a terminology concept and additional user-entered free text, this practice is strongly discouraged. The user-entered free text may refine, broaden or even contradict the meaning of the associated concept. This can confuse those interpreting the clinical statement. From a coding perspective, this type of functionality introduces obstacles in accurately representing the clinical statement as it was perceived and intended by the author. The way in which the

GUI was designed and used by the user in recording a clinical statement will influence how and what information is recorded and the author's interpretation of its meaning. Clinical safety risks may arise where decision support algorithms make use of the encoded concept without the original text, or the manner in which the clinical statement is presented to users through information exchange.

**Related requirements** 020622, 020661

#### **020661      Displaying user-entered free text and terminology with a distinction**

If the healthcare software system allows the user to record and store user-entered free text with a reference to a recorded terminology concept or CTD (e.g. the terminology description and free text constitutes a clinical statement), it **shall** clearly distinguish between the terminology description (i.e. preferred term) or CTD (if relevant) and the user-entered free text when displaying the *stored* clinical statement. The terminology concept **shall** be identified as a terminology description or CTD and the user-entered free text **shall** be identified as additional or supporting information, relevant to the terminology concept.

**Priority**          Conditional

#### **Additional Notes**

The intent of this requirement is to reduce the risk of the healthcare software system incorrectly displaying clinical statements where the user is not aware of the distinction between the terminology concept and the user-entered free text, and where the additional text may lead to a false impression that the underlying terminology concept recorded has been changed (at a machine-readable level) to reflect an alternate meaning.

This requirement also aims to maintain the integrity of terminology in local systems; i.e. the association between terminology concepts, concept identifiers, and terminology descriptions will not be edited or distorted in use. It is prohibited to edit terminology descriptions while they remain linked to their associated concept identifiers [NEHTA2013b].

The information must remain as recorded so that subsequent displays of the clinical statements are faithfully presented to the user as originally seen by the author at the time of creation.

This requirement does not restrict the recording of user-entered free text in terminology-enabled data fields as an alternative to recording a terminology concept for that data field.

**NOTE:** Although this requirement suggests it might be an option for the healthcare software system to allow users to record a clinical statement, constituting a terminology concept and additional user-entered free text, this practice is strongly discouraged. The user-entered free text may refine, broaden or even contradict the meaning of the associated concept. This can confuse those interpreting the clinical statement. From a coding perspective, this type of functionality introduces obstacles to accurately represent the clinical statement as it was perceived and intended by the author. The way in which the GUI was designed and used by the user in recording a clinical statement will influence how and what information is recorded and the author's interpretation of its meaning. Clinical safety risks may arise where decision support algorithms make use of the encoded concept without the original text, or the manner in which the clinical statement is presented to users through information exchange.

**Related requirements** 020622, 020621

**020620      Allow user-entered free text instead of recording terminology**

For terminology-enabled data fields, the healthcare software system **may** allow user-entered free text to be recorded and stored instead of using terminology if there is no option to capture the user's intended meaning using terminology concepts.

**Priority**      Optional

**Additional Notes**

The intent of this requirement is to reduce the risk of inappropriately using terminology in representing clinical statements. If the user's intended meaning is not supported by terminology and recording free text is not permitted in a terminology-enabled data field, the user may feel obliged to use a terminology concept even if the meaning of the concept differs from the user's intent. Therefore, the user should – where appropriate – be given an option to enter free text instead of being obliged to always use terminology for data entry.

This user-entered free text should be reviewed by trained staff who can then search and find the appropriate terminology concept, request the addition of a new terminology concept or request that the terminology concept be added to the relevant set for that particular data field, for future use. The success of this option relies both on trained staff who are available to do the review in a timely manner and on the willingness of the user to use this approach sparingly. Choosing the appropriate concept and not user-entered free text is definitely preferred [IHTSDO2014].

In addition to the healthcare software providing the capability to record, store and display user-entered free text instead of using terminology, it may also support the exchange of such clinical statements through the authoring of CDA documents. In such cases, implementers should be aware that some data fields carried over to eHealth CDA documents require a type Coded Text. Data fields mapped to these types of elements specified as mandatory will require a code from a specified value set to be present. If there is no known code provided, then there is no proper value for representation in the CDA document. However, text may be provided in addition to a code. For this reason, if healthcare software systems produce CDA documents that conform to eHealth specifications, use caution when conforming to this requirement.

**020631 Allowing LDCs instead of user-entered free text**

For terminology-enabled data fields, the healthcare software system **may** allow the user to use an LDC instead of recording free text, where the intended clinical statement cannot be expressed through the use of terminology concepts.

**Priority** Optional

**Additional Notes**

The intent of this requirement is to promote consistency of data entry through the creation of LDCs that are not found in the terminology releases published by NCTIS. Clearly defined concepts will promote reusability of commonly used terms and avoid contradictory statements being recorded in health records. This requirement does not refer to the recording of post-coordinated expressions.

**NOTE:** The rules for creating LDCs are defined in the *Clinical Terminology - Guidance for People and Processes* [NEHTA2014a]. For example, LDCs can only be created if the intended clinical statement cannot be expressed through the use of concepts available in the latest terminology release published by NCTIS.

**Related requirements** 020663

**020663 Using unique identifiers and a distinct coding system namespace for LDCs**

If the healthcare software system supports LDCs that are not part of a local extension of terminology, it **shall** assign a unique identifier to each newly created LDC that belongs to a local coding system with a unique coding system indicator. The coding system indicator **shall not** be that of SNOMED CT-AU, AMT or any other registered coding system, classification or code set.

**Priority** Conditional

**Additional Notes**

The intent of this requirement is to avoid the risk of confusing LDCs with terminology concepts or the use of concept identifiers not yet assigned a concept by AMT or SNOMED CT-AU regulators.

The 'coding system indicator' refers to information allowing the concept represented in CDA and messages to be identified as part of a specific coding system. It can also be used internally by the healthcare software system to distinguish between concepts and associated coding systems.

Where there might be a need to exchange the LDC, the fact that it is *not* an AMT or SNOMED CT-AU concept must be made clear. This may be accomplished by using a unique coding system namespace or coding system indicator registered with a national registry such as the HL7 OID Registry.

Organisations creating LDCs can contact the NCTIS to request a namespace identifier for use as part of LDC concept identifiers, to allow a mechanism for creating a local extension of terminology and for such LDCs to be adopted as part of the terminology release where appropriate. A namespace identifier is not required to create and use LDCs with terminology. Those creating local extensions of terminology must adhere to the relevant terms as stated in the SNOMED CT [IHTSDO2009] and Australian National Terminology [NEHTA2009] licence agreements.

**NOTE:** The rules for creating LDCs are defined in *Clinical Terminology - Guidance for People and Processes* [NEHTA2014a]. For example, LDCs can only be created if the intended clinical statement cannot be expressed through the use of concepts available in the latest terminology release published by NCTIS.

**Related requirements** 020631

**020640 LDCs using an NCTIS/IHTSDO namespace identifier**

If the healthcare software system supports LDCs that are part of a local extension of terminology, it **shall** assign a unique identifier, containing the NCTIS or IHTSDO issued namespace identifier, to each newly created LDC. The coding system indicator for such an LDCs **shall** be that of SNOMED CT-AU or AMT.

**Priority** Conditional

**Additional Notes**

The intent of this requirement is to avoid the risk of confusing LDCs with LDCs that are considered local extensions of terminology.

The 'coding system indicator' refers to information allowing the concept represented in CDA and messages to be identified to be part of a specific coding system. It can also be used by the healthcare software system, internally, to distinguish between concepts and associated coding systems.

Those creating LDCs can contact the NCTIS to request a namespace identifier for use as part of LDC concept identifiers, to allow a mechanism for creating a local extension of terminology and for such LDCs to be adopted as part of the terminology release where appropriate. A namespace identifier is not required to create and use LDCs with terminology. Those creating local extensions of terminology must adhere to the relevant terms as stated in the SNOMED CT [IHTSDO2009] and Australian National Terminology [NEHTA2009] licence agreements.

**NOTE:** The rules for creating LDCs are defined in the *Clinical Terminology - Guidance for People and Processes* [NEHTA2014a]. For example, LDCs can only be created if the intended clinical statement cannot be expressed through the use of concepts available in the latest terminology release published by NCTIS.

**Related requirements** 020631

## 2.2 Terminology map implementation

The requirements in this section only apply to organisations adopting AMT or SNOMED CT-AU (or both) through mapping.

Requirements listed as mandatory must be supported by the software. Conditional requirements are treated as mandatory, provided the condition stated in the requirement is satisfied. Recommended requirements are optional, but strongly encouraged.

### 2.2.1 Access to terminology

#### 020656 Details of the source and the target coding systems

The healthcare software system **shall** store or have access to the following information for all map sets in use:

- Name of the local or proprietary coding system;
- Coding system indicator of the local or proprietary coding system;
- The release or revision date or version of the local or proprietary coding system;
- The name of the terminology coding system (i.e. 'Australian Medicines Terminology (AMT)' or 'SNOMED CT-AU');
- Coding system indicator of the terminology coding system; and
- The release date or version of the terminology coding system.

**Priority** Mandatory

#### Additional Notes

The intent of this requirement is to ensure healthcare software systems have access to information needed to record, store, display and exchange clinical information represented through terminology. The information is also used by implementers responsible for integrating or updating map data in the healthcare software system. The information is either stored in the healthcare software system or in another location, accessible by the healthcare software system.

This requirement does not restrict the use of terminology servers.

The coding system indicator refers to information allowing the coding system to be identified. To identify the coding system, the following options are available:

- The SNOMED CT-AU OID ("2.16.840.1.113883.6.96");
- The AMT version 3 OID ("2.16.840.1.113883.6.96"), (same as SNOMED CT-AU);
- The AMT version 2 OID ("1.2.36.1.2001.1004.100");
- The HL7 v2 table 396 code "SCT" for SNOMED CT-AU;
- The HL7 v2 table 396 code "AMTv2" for AMT version 2; or
- The HL7 v2 table 396 code "SCT" for AMT version 3; or
- A unique coding system namespace or some other coding system indicator recognised or registered with a national or international registry (e.g. HL7 OID Registry) or standard.

**020657 Mandatory map data**

The healthcare software system **shall** store and have access to the following map data for all maps in use:

- Map set version or a reference to the map set version;
- Unique identifier of the local or proprietary concept (if available);
- Local or proprietary concept description;
- Terminology concept identifier;
- Terminology description (i.e. preferred term).

**Priority** Mandatory

**Additional Notes**

The relevant maps data needs to contain all information required for information exchange.

The version of the map set may be the same as the version of the terminology release, as this will allow an unambiguous method of determining if the map has become out-dated due to a more recent terminology release published by NCTIS. Alternatively, the map set version is the date the map set was reviewed and updated, or a combination of the local or proprietary coding system and terminology release dates or versions. Regardless of the approach, the map version must convey sufficient information to ensure proper maintenance of the maps.

When the healthcare software system gets updated with a new version the map set, it must be ensured that all storage locations (e.g. database tables) of the source, target and map data are reviewed and updated in accordance with the new version of the maps. For example, any maps that refer to concepts that are retired in the new version of the target coding system must either be retired and no longer be used, or updated to refer to a non-retired concept in the later version of the target coding system. Once this process has occurred, the target maps are considered to be based on the newly updated coding system version. For more guidelines and requirements related to the revision and maintenance of maps, refer to *Clinical Terminology - Guidance for People and Processes* [NEHTA2014a], the *AMT Mapping Guidelines* [NEHTA2012a] and the *SNOMED CT-AU Mapping Guidelines* [NEHTA2014h] documentation.

In the context of eHealth, the source coding system is generally the local or proprietary coding system and the terminology is the target coding system.

**Related requirements** 022508

**022508 Additional map data**

The healthcare software system **should** store or have access to the following stored map data, if available and necessary:

- Unique identifier of the map set;
- Unique identifier for each map;
- Terminology description (i.e. preferred term) identifier;
- Terminology data labelled as *effectiveTime*, *sourceId*, *active*, *typeId*, *DescriptionStatus*, *referencedComponentId*, *AcceptabilityValue*, *referencedComponent* and/or *ConceptStatus* in the terminology release files.

**Priority** Recommended

**Additional Notes**

The intent of this requirement is to allow the healthcare software system to incorporate relevant map data where available, in order to support appropriate maintenance procedures and information exchange.

The unique identifier of the map set may be needed if multiple map sets are in use. A unique identifier for each map may be needed to clearly identify the map and speed up processing of data retrieval.

For AMT v2, the description ID is the ID of the preferred term, whereas for AMT v3 and SNOMED CT-AU, the description ID is the ID of the preferred term from the *Australian dialect* reference set.

The need for the healthcare software system storing or having access to the terminology data attributes such as *effectiveTime*, *active*, *DescriptionStatus*, and *ConceptStatus* will be determined by how updates are performed as well as the complexity of terminology use by the healthcare software system.

**Related requirements** 020657

## 2.2.2 Storage

### 020658 Storing terminology maps

When recording and storing a clinical statement using terminology via a map, the healthcare software system **shall**:

Store the following information from the local or proprietary coding system concept:

- Identifier of the local or proprietary concept (if available);
- Local or proprietary concept description; and
- Original text that was displayed to, and stored at the time of data entry.

Store the following information from the mapped or translated terminology concept if the *translation* is not done at the time of authoring a CDA document or message:

- Terminology concept identifier;
- Terminology description (i.e. preferred term); and
- Terminology release version or a reference to the version stored elsewhere. Alternatively, the version of the map or a reference to the map version.

**Priority**            Mandatory

#### **Additional Notes**

This requirement is based on the IHTSDO guidelines on SNOMED CT implementation [IHTSDO2014]. In addition, storing the AMT or SNOMED CT-AU release with the concept identifier allows traceability to the release that the healthcare software system was using at the time of data entry.

# Acronyms

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<b>Acronym</b>	<b>Description</b>
AMT	Australian Medicines Terminology
CDA	Clinical Document Architecture: an XML-based mark-up standard intended to specify the encoding, structure and semantics of clinical documents exchanged between healthcare software systems.
CTD	customised terminology description
FSN	fully specified name
GUI	graphical user interface
HL7	Health Level Seven
IHTSDO	International Health Terminology Standards Development Organisation
LDC	locally defined concept
NCTIS	National Clinical Terminology and Information Service (within NEHTA)
OID	object identifier
PBS	Pharmaceutical Benefits Scheme
SNOMED CT	Systematized Nomenclature of Medicine – Clinical Terms
SNOMED CT-AU	Australian extension of SNOMED CT

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# Glossary

Term	Meaning
assessment	A determination about whether specified requirements related to a product, process, system, person or body have been fulfilled.
clinical information	Information about a subject of care, relevant to the health or direct treatment of that subject of care that is recorded by or on behalf of a healthcare provider [AS5021].
clinical statement	A discrete clinical record entry.
coding system	A system of code sets, coding standards and code maintenance procedures together with their authorization and governance as a mechanism used to allocate a code to a represent a concept, i.e. the design of code in a domain [AS5021].
coding system indicator	An attribute value or property that uniquely identifies a coding system.
compliance	Adherence to the requirements of laws, industry and organisational standards and codes, principles of good governance and accepted community and ethical standards.
concept	<p>Refers to a clinical meaning or idea.</p> <p>A concept may have a unique numeric identifier (ConceptId). A concept is generally represented by a unique human-readable description (e.g. fully specified name (FSN)). The concept may also be formally defined in terms of its relationship with other concepts.</p>
concept model	A set of rules that determines the permitted sets of relationships between particular types of concept. The concept model specifies the attributes that can be applied to particular concepts and the ranges of permitted values for each of these attributes. There are also additional rules on the cardinality and grouping of particular types of relationships [IHTSDO2014].
concept identifier	Refers to a unique identifier (ConceptId) within the coding system that identifies a particular concept, and is designated as the value to use to identify concepts when communicating between systems. The registration of the OID or the underlying documentation for the coding system should be used to determine which symbols are designated for this purpose.
customised terminology description	<p>Customised terminology description is a description. It refers to an alternative synonym not found in the vocabulary of AMT or SNOMED CT-AU, but used within the GUI to meet specific usability needs within a given context of a local community of users (e.g. short names).</p> <p>The healthcare software system has the terminology implemented as a native interface terminology but does not display the terminology preferred terms in the GUI for some or all implemented terminology concepts. Instead the healthcare software system displays the customised terminology descriptions (CTDs) where required.</p> <p>When recording and storing terminology, the healthcare software system records the terminology concept identifier, terminology description, terminology version and the CTD that was displayed to the user at the time of recording the terminology concept.</p> <p>CTDs have undergone a premeditated development process for the purpose of meeting specific usages and care must be taken not to replace or modify the terminology release in any way. The outcome is that each CTD semantically matches the terminology concept's FSN in the NCTIS release,</p>

Term	Meaning
	<p>and therefore does not differ in meaning from the terminology concept it describes.</p> <p>The development of CTDs must not be based on other terminology synonyms (i.e. preferred or acceptable terms) as this may result in deviating from the true meaning of the terminology concept. Instead the terminology's FSN must be used in developing a new CTD for the terminology concept.</p> <p>The notion of CTDs does not refer to the modification of terminology descriptions or creation of LDCs at the time of recording clinical statements at runtime.</p>
data field	<p>In the structure of a database, a data field is the smallest component in which data is entered through data capture or data entry. It is usually mapped to a corresponding interface element in a GUI that accepts the input in the format of alphanumeric text or binary strings.</p> <p>All data fields in the same database have unique names, several data fields make up a data record, several data records make up a data file, and several data files make up a database.</p>
description	<p>A description is a term or name assigned to a concept for the purpose of describing the concept. Multiple descriptions might be associated with a concept.</p>
excluded words	<p>Words that, in a given language, are so frequently used, or have such poor discriminating power, that they are suggested for exclusion from the indices used to support textual searches [IHTSDO2014].</p>
expression	<p>A structured combination of one or more concept identifiers used to express an instance of a clinical idea [IHTSDO2014].</p>
fully specified name	<p>A fully specified name is a description. Each terminology concept has a fully specified name (FSN) intended to provide an unambiguous way to name the terminology concept. The purpose of the FSN is to uniquely describe the terminology concept and clarify its meaning. The FSN is not a commonly used terminology description or natural phrase, and would not be expected to appear in the human-readable representation of a clinical record.</p>
healthcare software system	<p>A system that deals with the collection, storage, retrieval, communication and use of health related data, and information and knowledge pertaining to subjects of care. The healthcare software system may be a standalone application or may be a combination of integrated systems, including terminology browsers or terminology servers. Terminology browsers allow the content and structure of terminology to be explored and reviewed, whereas terminology servers provide programmatic access to terminology data. Regardless of implementation type, the guidance in this document applies to those healthcare software systems using AMT or SNOMED CT-AU in one way or another. For more details on the implementation approaches, refer to the <i>SNOMED CT Technical Implementation Guide</i> [IHTSDO2014] and the <i>Australian Medicines Terminology v3 Model Technical Implementation Guide</i> [NEHTA2013b].</p>
intentional constraints	<p>Intentional constraints imposed on a particular data field refer to measures taken by system designers, developers or implementers in allowing only certain concepts, meeting certain criteria or falling under a particular conceptual category, to be available for recording and storing by the user.</p> <p>For example, if a data field captures clinical procedures, displayed to the user as a list of allowable descriptions, it would only display terminology concepts belonging to the SNOMED CT-AU <i>Procedure Foundation</i> reference set and would not display terminology concepts from the <i>Problem Diagnosis</i></p>

Term	Meaning
	<p>reference set.</p> <p>Intentional constraints may be:</p> <ul style="list-style-type: none"> <li>• intentional constraints defined through system configuration;</li> <li>• intentional constraints defined through imbedded hard-coded system rules; or</li> <li>• intentional constraints defined through inclusion or exclusion of terminology release content (e.g. reference sets) in the healthcare software system.</li> </ul>
locally defined concept	<p>A locally defined concept (LDC) is a concept, created for use by a local community of users within a defined knowledge domain, used to broaden the scope of coverage of terminology for use in a specific language, specialty or jurisdiction.</p> <p>LDCs are created and used as a transition strategy to move away from an ad hoc approach to recording, storing and displaying clinical information that may be ambiguous, contradictory, inconsistent, and unmanageable towards a more structured approach, where it is determined that the existing terminology releases do not adequately meet the requirements of the local community of users.</p> <p>If users find that the latest terminology release data do not support the ability to author appropriate clinical statements, they can contact the NCTIS obtain a namespace identifier and ask for an update to the terminology release data to address identified gaps.</p> <p>References to LDCs in this document refer only to those concepts that are used with terminology. LDCs are not CTDs, because there are no connections or links with any terminology concept, and they are not used as appropriate alternative synonyms to the synonyms found in the terminology releases.</p>
map	<p>An index from one concept to another, sometimes using rules that allow translation from one representation to another, indicating degree of equivalence [NEHTA2014h].</p>
map source	<p>A terminology, coding scheme or classification used as the starting point for map production (in the context of mapping) [NEHTA2014h].</p>
map target	<p>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 [NEHTA2014h].</p>
namespace identifier	<p>A number allocated to an institution that is permitted to maintain LDCs as extensions to the current terminology release content. The <i>Australian National Terminology licence agreement</i> [NEHTA2009] states: "The Licensee may not in respect of the National Release create any Standards-Based Extension or any Standards Based Derivative unless it has first been issued with a Namespace Identifier".</p> <p>The namespace identifier indicates the provenance of each terminology component. For example, in a concept in the AMT created by NEHTA, the namespace identifier is 1000036, as seen in the identifier: 2166401<b>1000036</b>103. For a non-AMT concept created by the Pharmaceutical Benefits Division (PBD) for an item in the Pharmaceutical Benefits Scheme (PBS) data file, the namespace identifier is 1000144, as seen in the identifier: 5729<b>1000144</b>108.</p>
native interface terminology	<p>The healthcare software system uses terminology in its native form such that users interact with the terminology concepts through the GUI and they are stored and shared throughout the system.</p> <p>For example, the healthcare software system displays AMT or</p>

Term	Meaning
normal form	SNOMED CT-AU (or both) preferred terms for selection or recording by the user.
organisation	In the context of this document, this refers to an organisation such as a vendor, healthcare provider or health jurisdiction involved in one or more of the following activities: <ul style="list-style-type: none"><li>• development of healthcare software systems;</li><li>• development of terminology maps;</li><li>• development of custom subsets/intentional constraints for native interface terminology; or</li><li>• integration, implementation or update of terminology data in healthcare software systems.</li></ul>
original text	The original text is the text seen by the user at the time of recording a concept or expression (i.e. post-coordinated or free text) in a human-readable format. The original text may take on various forms, depending on the medium through which original text is presented. Regardless of medium, the original text accurately conveys the meaning of the clinical statement as originally intended by the author at the time of recording and storage. In most cases, the original text would be the same as the terminology description i.e. preferred term (a.k.a. the <i>displayName</i> in CDA) where the user sees and selects a terminology concept from the GUI. Alternatively, the original text would be same as the: <ul style="list-style-type: none"><li>• CTD text displayed and selected by the user;</li><li>• text seen by the user typing a free-formed expression or a post-coordinated expression; or</li><li>• a combination of a terminology description and user-entered free text.</li></ul> In this case the terminology description (display text or <i>displayName</i> ) is different from the original text.
partial words	A technique used in dealing with search criteria containing multiple partial words that accurately produce search results with minimal typing.
post-coordinated expression	Representation of a clinical meaning using a combination of two or more concept identifiers is referred to as post-coordination [IHTSDO2014].
preferred term	A concept description that is deemed to be the most clinically appropriate way of expressing a concept in the healthcare software system. SNOMED CT-AU and AMT v3 preferred terms are determined by the <i>acceptabilityId</i> value of '90000000000548007' (i.e. 'Preferred') defined in the Australian dialect reference set. AMT v2 preferred terms are determined by the <i>DescriptionType</i> value of '1' in the AMT v2 description release file.
progressive searching	The progressive updating of search results as more characters are typed [Microsoft2010a]. Progressive searching does not auto-complete based on the input.
recording	In the context of this document, recording refers to the action of data entry, by which a user populates a data field with data either by typing text, selecting items from a dropdown or list, importing, or copying and pasting from an alternative source, etc. This should not be confused with the storage of data in a healthcare software system.

Term	Meaning
reference set	<p>A work consisting of a set of references to SNOMED CT or AMT components which may associate additional properties with components that are members of the set or which may indicate associations between members of the set and content of another nomenclature, classification or knowledge structure. The uses of reference sets include identification of subsets of SNOMED CT or AMT content, representation of alternative hierarchical structures and cross-maps to classifications.</p> <p>'Reference set' is used in this document to indicate an NCTIS published reference set such as <i>Problem/ Diagnosis reference set</i>, <i>Procedure foundation reference set</i>, <i>Medicinal Product Pack reference set</i>, or <i>Trade Product Unit Of Use reference set</i>.</p>
runtime	The period during which a computer software program is executing.
stemming	This is a technique used in search algorithms to reduce a word to its stem, base or root form and to account for word form variants. For example, 'inflamed', 'inflammatory', 'inflammation'.
store, storage or storing	This refers to non-volatile storage of data by keeping data in a location (e.g. system database) in such a manner that it can be retrieved by the healthcare software for processing at any time when required. Storing data results in the data being persisted until it gets removed.
subset	'Subset' and 'custom subset' are used in this document to indicate a custom portion of the terminology content, which is not an NCTIS published reference set, identified by the developer for a specific purpose.
synonym	A term that is an acceptable alternative to the preferred term as a way of expressing a concept. Synonyms allow representations of the various ways a concept may be described. Synonyms and preferred terms (unlike FSNs) are not necessarily unique. More than one concept might share the same preferred term or synonym [IHTSDO2014].
terminology concept	This refers to a clinical meaning identified by a unique numeric identifier (concept identifier) that never changes. Each terminology concept is represented by a unique human-readable fully specified name (FSN). The terminology concept is formally defined in terms of its relationship with other terminology concepts.
terminology concept identifier	Refers to a permanent unique numeric identifier that identifies a particular terminology concept.
terminology description	Refers to a term or name assigned to a SNOMED CT-AU or AMT concept. The AMT has adopted the SNOMED CT description types. 'Term' in this context means a phrase used to name a terminology concept. Multiple descriptions might be associated with a terminology concept identified by its concept identifier. SNOMED CT concept descriptions include fully specified names, preferred terms and synonyms. Preferred terms are recommended where the term will be displayed in GUIs. [NEHTA2012c].
terminology mapping	<p>The healthcare software system uses a local or proprietary coding system – other than AMT or SNOMED CT-AU – in its native form, such that users interact with the local or proprietary coding system through the GUI and are stored and shared throughout the system.</p> <p>The local or proprietary coding system has been mapped to AMT or SNOMED CT-AU ('terminology') terms for the purpose of transferring information externally in system-to-system messages or CDA documents.</p> <p>The terminology fully specified names (FSN) must be used to map the source concept to the target concept, to ensure that the true or full meaning of the</p>

<b>Term</b>	<b>Meaning</b>
	terminology concept is understood and its scope is taken into account in the map.
terminology server	Software that provides access to terminology (or to other coding systems). A terminology server typically supports searches and navigation through concepts. A server may provide a user interface (e.g. a browser or set of screen controls) or may provide low-level software services to support access to terminology by other applications.
word-order	A technique used to produce accurate search results without relying on exact phrase matches. For example, 'codeine paracetamol' should match 'paracetamol 500 mg + codeine 10 mg tablet'.

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