**Integrating the Healthcare Enterprise**



**IHE PCC (Patient Care Coordination)**

**Technical Framework Supplement**

**Clinical Mapping (CMAP)**

**Draft in preparation for Public Comment**

Date: April 23, 2015

Author: Alex Lippitt

Email: <pcc@ihe.net>

**Foreword**

This is a supplement to the IHE <Domain Name> Technical Framework <VX.X>. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

*<For Public Comment:>* This supplement is published on <Month XX, 201x> for Public Comment. Comments are invited and may be submitted at [http://www.ihe.net/<domain>/<domain>comments.cfm](http://www.ihe.net/Technical_Framework/public_comment.cfm). In order to be considered in development of the Trial Implementation version of the supplement, comments must be received by <Month XX, 201X>.

*<For Trial Implementation:>* This supplement is published on <Month XX, 201X> for Trial Implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the <Domain Name> Technical Framework. Comments are invited and may be submitted at [http://www.ihe.net/<domain>/<domain>comments.cfm](http://www.ihe.net/%3cdomain%3e/%3cdomain%3ecomments.cfm).

This supplement describes changes to the existing technical framework documents.

“Boxed” instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume.

Amend section X.X by the following:

Where the amendment adds text, make the added text bold underline. Where the amendment removes text, make the removed text bold strikethrough. When entire new sections are added, introduce with editor’s instructions to “add new text” or similar, which for readability are not bolded or underlined.

General information about IHE can be found at: [www.ihe.net](http://www.ihe.net).

Information about the IHE <Domain Name> domain can be found at: <http://www.ihe.net/Domains/index.cfm>.

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at: <http://www.ihe.net/About/process.cfm> and <http://www.ihe.net/profiles/index.cfm>.

The current version of the IHE <Domain name>Technical Framework can be found at: <http://www.ihe.net/Technical_Framework/index.cfm>.

*<Comments may be submitted on IHE Technical Framework templates any time at* [*http://ihe.net/ihetemplates.cfm*](http://ihe.net/ihetemplates.cfm)*. Please enter comments/issues as soon as they are found. Do not wait until a future review cycle is announced.*

CONTENTS

[Introduction to this Supplement 5](#_Toc413591291)

[Open Issues and Questions 5](#_Toc413591292)

[Closed Issues 5](#_Toc413591293)

[General Introduction 6](#_Toc413591294)

[1.2.1 Appendix A - Actor Summary Definitions 6](#_Toc413591295)

[1.2.2 Appendix B - Transaction Summary Definitions 6](#_Toc413591296)

[Glossary 6](#_Toc413591297)

[Volume 1 – Profiles 8](#_Toc413591298)

[Clinical Mapping (CMAP) Profile 8](#_Toc413591299)

[X.1 CMAP Actors, Transactions, and Content Modules 8](#_Toc413591300)

[X.1.1 Actor Descriptions and Actor Profile Requirements 10](#_Toc413591301)

[X.1.1.1 <Actor A> 10](#_Toc413591302)

[X.1.1.2 <Actor B> 10](#_Toc413591303)

[X.4.1 Concepts 11](#_Toc413591304)

[X.4.2 Use Cases 11](#_Toc413591305)

[X.4.2.1 Use Case #1: Medical Vital Sign Observation Monitoring Discrete Data Retrospective Utilization 11](#_Toc413591306)

[X.4.2.1.1 Medical Vital Sign Observation Monitoring Discrete Data Retrospective Utilization Use Case Description 12](#_Toc413591307)

[X.4.2.1.2 Clinical Mapping (CMAP) Process Flow: Medical Vital Sign Observation Monitoring Discrete Data Retrospective Utilization 14](#_Toc413591308)

[X.4.2.2 Use Case #2: Creating Billing Documents From Clinical Encounter Documentation 15](#_Toc413591309)

[X.4.2.2.1 Creating Billing Documents From Clinical Encounter Documentation Use Case Description 15](#_Toc413591310)

[X.4.2.2.2: Clinical Mapping (CMAP) Process Flow: Creating Billing Documents From Clinical Encounter Documentation Use Case 16](#_Toc413591311)

[X.5 Clinical Mapping (CMAP) Security Considerations 16](#_Toc413591312)

[X.6 Clinical Mapping (CMAP) Cross Profile Considerations 16](#_Toc413591313)

[Appendices 18](#_Toc413591314)

[A.1 Appendix A – Actor Requirements for Volume 2 18](#_Toc413591315)

[A.1.1 Clinical Mapping Requestor Requirements 18](#_Toc413591316)

[A.2 Clinical Mapper Requirements 18](#_Toc413591317)

[Volume 2 – Transactions 19](#_Toc413591318)

[3.Y <Transaction Name [Domain Acronym-#]> 19](#_Toc413591319)

[3.Y.1 Scope 19](#_Toc413591320)

[3.Y.2 Actor Roles 19](#_Toc413591321)

[3.Y.3 Referenced Standards 20](#_Toc413591322)

[3.Y.4 Interaction Diagram 20](#_Toc413591323)

[3.Y.4.1 <Message 1 Name> 21](#_Toc413591324)

[3.Y.4.1.1 Trigger Events 21](#_Toc413591325)

[3.Y.4.1.2 Message Semantics 21](#_Toc413591326)

[3.Y.4.1.3 Expected Actions 22](#_Toc413591327)

[3.Y.4.2 <Message 2 Name> 22](#_Toc413591328)

[3.Y.4.2.1 Trigger Events 22](#_Toc413591329)

[3.Y.4.2.2 Message Semantics 22](#_Toc413591330)

[3.Y.4.2.3 Expected Actions 22](#_Toc413591331)

[3.Y.5 Security Considerations 23](#_Toc413591332)

[3.Y.5.1 Security Audit Considerations 23](#_Toc413591333)

[3.Y.5.1.(z) <Actor> Specific Security Considerations 23](#_Toc413591334)

[Appendices 24](#_Toc413591335)

[Appendix A – <Appendix A Title> 24](#_Toc413591336)

[A.1 <Add Title> 24](#_Toc413591337)

[Appendix B – <Appendix B Title> 24](#_Toc413591338)

[B.1 <Add Title> 24](#_Toc413591339)

[Volume 2 Namespace Additions 24](#_Toc413591340)

[5. Namespaces and Vocabularies 25](#_Toc413591341)

# Introduction to this Supplement

This Supplement modifies the following Volumes

Volume 1 – Adds a Clinical Mapping (CMAP) profile to manage nomenclature transformations mapping to and from clinical terminologies

## Open Issues and Questions

## Closed Issues

Could this profile be extended to include any nomenclature mapping to provide SNOMED, LOINC, RXNORM and other clinical mappings from other standard nomenclatures, clinical or non-clinical? YES

# General Introduction

1.2.1 Appendix A - Actor Summary Definitions

Add the following actors to the IHE Technical Frameworks General Introduction list of Actors:

<Add any actor definitions for new actors defined specifically for this profile. These will be added to the IHE TF General Introduction list of Actors namespace.>

|  |  |
| --- | --- |
| Actor | Definition |
| Clinical Mapping Requestor (See Note 1 for Requirements) | The Clinical Mapping Requestor in conjunction with a requesting actor provides a list of terms in a Translate Code Request transaction with:   * Items to be mapped * Terminology of the items * targeted terminology for mapping |
| Clinical Mapper (See Note 2 for Requirements) | The Clinical Mapper responds to the Translate Code Request transaction from the Clinical Mapping Requestor.  The Clinical Mapper shall be:   * Capable of handling multiple mapping tables to be invoked singularly or in combination depending on the terminologies to be mapped * Context mapping capable |

1.2.2 Appendix B - Transaction Summary Definitions

Add the following transactions to the IHE Technical Frameworks General Introduction list of Transactions:

<Add any transaction definitions for new transactions defined specifically for this profile. These will be added to the IHE TF General Introduction list of Transactions namespace.>

|  |  |
| --- | --- |
| Transaction | Definition |
| Translate Code | This transaction uses either a REST or SOAP based format to provide a list of clinical items to be mapped to specific clinical terminology equivalents. Projected terminologies include LOINC, SNOMED, and ICD-10.This transaction may require several iterations to get to a match or matches, or a failure: The Clinical Mapper Actor may request additional context from the Clinical Mapping Requester in order to overcome an ambiguous mapping. |

Glossary

Add the following glossary terms to the IHE Technical Frameworks General Introduction Glossary:

<Any glossary additions associated with the profile draft go here.>

|  |  |
| --- | --- |
| Glossary Term | Definition |
|  |  |
|  |  |

Volume 1 – Profiles

<Reserve a subsequent section number in the current domain Technical Framework Volume 1 (DOM TF-1). Replace the letter “X” with that section heading number. This number should not change when this supplement is added to the Final Text Technical Framework. In this manner, references should be able to be maintained going forward.>

# Clinical Mapping (CMAP) Profile

Mapping to and from clinical terminologies is important to handle situations in which:

* Device generated observations need to be converted to clinical terminologies for use in clinical decision making and record keeping
* Clinical terminologies need to be converted to charge capture / billing compatible terminologies for communicating diagnoses and procedures:
  + ICD-10 for international purposes
  + Others as needed for national extensions
* Clinical terminologies need to be converted to other clinical terminologies (future)

Benefits include:

* Significant time savings
* Data entry error reduction
* Consistency in practice to permit comparison and aggregation of data post-conversion

## X.1 CMAP Actors, Transactions, and Content Modules

This section defines the actors, transactions, and/or content modules in this profile. General definitions of actors are given in the Technical Frameworks General Introduction Appendix A at <http://www.ihe.net/Technical_Framework/index.cfm>.

Figure X.1-1 shows the actors directly involved in the CMAP Profile and the relevant transactions between them. If needed for context, other actors that may be indirectly involved due to their participation in other related profiles are shown in dotted lines. Actors which have a mandatory grouping are shown in conjoined boxes.

↓Translate Code [PCC-Y]

↓Retrieve Code Mappings [PCC-Z]

Clinical Mapping Requestor

Actor A

Clinical Mapper

Actor F

Figure X.1-1: CMAP Actor Diagram

Table X.1-1 lists the transactions for each actor directly involved in the CMAP Profile. To claim compliance with this Profile, an actor shall support all required transactions (labeled “R”) and may support the optional transactions (labeled “O”).

Table X.1-1: Clinical Mapping Profile - Actors and Transactions

| Actors | Transactions | Optionality | Reference |
| --- | --- | --- | --- |
| Clinical Mapping Requestor | Translate Code | R | PCC TF-2: Y |
| Retrieve Code Mappings | O | PCC TF-2: Z |
| Clinical Mapper | Translate Code | R | PCC TF-2: Y |
| Retrieve Code Mappings | O | PCC TF-2: Z |

**X.2 Clinical Mapping (CMAP) Actor Options**

Options that may be selected for each actor in this profile are listed in the table X.2-1 below.

**Table X.2-1: Clinical Mapping - Actors and Options**

| **Actor** | **Option Name** | **Reference** |
| --- | --- | --- |
| Clinical Mapping Requestor | Device Mapping | PCC TF-1:X.2.1 |
| Problem Mapping | PCC TF-1:X.2.2 |
| Retrievable Mappings | PCC TF-1:X.2.3 |
| Clinical Mapper | Device Mapping | PCC TF-1:X.2.1 |
| Problem Mapping | PCC TF-1:X.2.2 |
| Retrievable Mappings | PCC TF-1:X.2.3 |

Note 1: An actor must implement at least one of the mapping options.

How should other vocabulary be supported by this profile?

### X.2.1 Device Mapping Option

The purpose of the Device Mapping Option is to support translation of IEEE medical device codes produced by personal health monitoring devices into LOINC codes commonly used for reporting measurements in EHR and other Health IT systems.

A Clinical Mapping Requester Actor supporting the Device Mapping Option …

A Clinical Mapper Actor supporting the Device Mapping Option …

### X.2.2 Problem Mapping Option

The purpose of the Problem Mapping Option is to support translation of SNOMED CT codes produced by EHR and Health IT systems into ICD-10 codes commonly used for billing and population health reporting.

A Clinical Mapping Requester Actor supporting the Problem Mapping Option …

A Clinical Mapper Actor supporting the Problem Mapping Option …

### X.2.3 Retrievable Mappings Option

The purpose of the retrievable mappings option is to identify Clinical Mapping Requester and Clinical Mapper actors that support the Retrieve Code Mappings transaction.

A Clinical Mapping Requester Actor supporting the Retrievable Mappings Option shall implement the Retrieve Code Mappings transaction.

A Clinical Mapper Actor supporting the Problem Code Mapping Option shall implement the Retrieve Code Mappings transaction.

**X.3 Required Actor Groupings**

There are no required actor groupings.

## X.4 Overview

The Clinical Mapping profile supports the need of systems to translate concepts from one terminology to another to support exchange of information between different systems. These translations are often needed at workflow boundaries where concepts used in one workflow have a different perspective than those in another workflow. For example, in reporting device information to an EHR system, the device vendor may wish to capture device measurements of vital signs using internationally recognized terminologies provided by those devices, but the EHR may need to report these measurements using different terminologies to support local requirements. Another example would be for cases where data captured to support clinical activity for diagnosis or treatment must then be used to facilitate charge capture processes.

### X.4.1 Concepts

A crosswalk is a mapping from one coding system to another in which concepts from the source coding system are mapped to concepts in the target code system. The simplest form of crosswalk is a lookup table. This form is often used to translate from local codes to codes from standard terminologies. The code translation process in these cases is depicted below.

Code  
Translation

Source Code

Target Code

Figure X.4.1-1 Simple Translation

Lookup tables are often sufficient for many cases, but can be insufficient when concepts are defined at different levels of granularity, or when additional context is needed in order to perform the translation. For example, distinctions involving location or findings associated with a diagnosis may be encoded differently. In SNOMED CT, the concepts associated with location and additional findings are usually separately encoded (post-coordinated) in a SNOMED CT expression. In ICD-10 the location is directly associated in the code (pre-coordinated). Thus, a SNOMED CT code describing a myocardial infarction could be translated into several different ICD-10 codes, depending upon where the infarct occurred, and whether or not there was an associated ST elevation finding in the ECG. The location information can appear elsewhere in the SNOMED CT expression (e.g., post-coordinated in finding site), and would provide the location context that enables the mapping into ICD-10. This additional information needed to perform an accurate mapping is described as the input context.

Source Code + Location  
+ Finding

Code  
Translation

Target Code

Input Context

Figure X.4.1-2 Translation with Input Context

In the above case, performing the translation in reverse (from ICD-10 to SNOMED-CT) would lose information about location and ST elevation due to the way that SNOMED CT uses post-coordination to encode these concepts. To preserve this, the translation can generate not just a code, but also other contextual information as part of the output. This additional information produced by the mapping is described as the output context.

Code  
Translation

Target Code + Location  
+ Finding

Source Code

Output Context

Figure X.4.1-3 Translation with Output Context

When the codes being transformed identify not just concepts, but also specific physical measurements, the values associated with those codes may also need to be transformed. For example, blood glucose could be reported in units of grams/liter (g/l) when using the source coding system and in units of milligrams per deciliter (mg/dl) in a target coding system. The source units would be part of the input context, and the units used with the target code, and the scale factor is simply another component of the output context.

Output Context

Target Code

+ Unit

+ Scale Factor

Code  
Translation

Source Code

+ Units

Input Context

Figure X.4.1-3 Translation with Input and Output Context and Scale Factor

Crosswalks represent clinical knowledge that may be complex to implement but which changes infrequently. Systems which must perform translation between coding systems can be configured to cache translations, refreshing translations periodically.

In some cases, the translation can be performed locally just by inspecting a table mapping codes and contexts associated in a source coding system to codes and output contexts in the target coding system. This may be useful in cases where a few codes need to be translated periodically, but where codes are translated frequently. In other cases, implementations may not expose the crosswalk in a format that is suitable for download, or the data used to support the implementation may be proprietary. Thus, the CMAP profile supports access to individual translations (which could be cached and refreshed according to policy), and provides an optional transaction enabling all translations to be accessed in a tabular format.

### X.4.2 Use Cases

#### X.4.2.1 Use Case #1: Medical Vital Sign Observation Monitoring Discrete Data Retrospective Utilization

This use case addresses the recording of medical vital signs monitoring from an IHE PCD compliant device using IEEE 11073 nomenclature to a patient medical monitor application using LOINC clinical nomenclature in predetermined intervals.

Using 2015 medical device technology a clinician or provider can view patient data generated by patient care devices in an inpatient setting or outpatient encounter room, but when that same person accesses his or her EHR application that data is not available. Getting semantically correct clinical data from patient care devices into clinical applications is generally not achieved today for a couple of reasons:

* The applicable nomenclature from medical devices, IEEE 11073 10101, is not one of the clinically approved nomenclatures in most if not all countries, reducing the incentive to use IEEE 11073 data in clinical applications. The update under review, IEEE 11073 10101a, is also not one of the approved clinical nomenclatures as well.
* There are no commonly accepted mappings of IEEE 11073 10101 to clinical nomenclatures (LOINC and SNOMED primarily) for clinical measures although there are vendors who have done so as proprietary interfaces. The result is that there is no reliable way to combine this data given the lack of generally accepted mappings.

As a result much of this numeric data generated from medical applications is either not reentered into clinical systems or reentered at significant risk of error. The clinical impact is that medical device generated clinical data is generally not available in clinical or research applications.

In the short term the missing link is a mapping service that can be accessed in a straightforward manner by clinical applications to transform IEEE clinical observations to LOINC nomenclature. The ground work mapping has been accomplished by Clem McDonald, MD and Swapna Abhyankar MD under auspices of the US National Library of Medicine (NLM) in part as requested by the US Veterans Health Administration (VHA). By late 2015 these mappings should have received appropriate vettings to be accepted as standard.

Benefits that can be derived from applications utilizing these mappings include:

* **Improved data collection and patient safety**: Much of the clinical data would no longer need to be reentered from the device to the clinical application, effectively eliminating risks of neglecting to implement the data or making transcription errors.
* **Improved patient care**: Additional medical device observation data would be available to clinicians. Increased observation data would be included in the patient’s chart as well as in near real time for the clinical application for clinical decision support.

In the short term, the benefits would apply to a high volume of work including any inpatient or outpatient scenario involving devices providing vital sign observations. This would only increase more clinical observations are added beyond vital signs.

##### X.4.2.1.1 Medical Vital Sign Observation Monitoring Discrete Data Retrospective Utilization Use Case Description

This use case involves the monitoring of vital signs in an inpatient setting (ICU, Step Down, Observation, General / Surgical) or outpatient encounter. Vital signs are generally available at the point of care visually from monitoring displays. What is not available and is addressed by this use case is the ability to view and analyze vital signs in time sequence retrospectively for patient care or study purposes.

The patient is either transported to an inpatient room or outpatient exam room, or the patient walks the appropriate setting. The patient is attached to a monitor or monitors to collect core vital signs observations which may vary by setting; a sample minimal set taken from US Meaningful Use consists of the following:

* Body Temperature
* BP Diastolic
* BP Systolic
* Head Circumference (manual entry)
* Heart Rate
* Height (manual entry)
* Height (Lying)
* O2 % BldC Oximetry
* Respiratory Rate
* Weight Measured

Observations taken by medical device may be pre- or post-coordinated. In pre-coordinated measurements the vital signs are automatically qualified / constrained by such variables as body site and patient positions. In other cases these must be manually entered in the patient device or patient clinical application to be post coordinated. Medical device observations are saved by the device in many cases in machine code. This data can then be translated by IHE compliant mappings to IEEE 11073 medical observations contained in the NIST (US National Institutes of Standards and Technology RTMMS Rosetta Terminology Mapping Management System. The proposed profile provides the missing link to pushing these observations into the clinical application, often the patient’s chart, by adding LOINC versions of the IEEE 11073 observations to the HL7 v2 message sent from the Device Observation Reporter to the Device Observation Consumer.

This mapping requires the following mapping tables:

* The current “Harmonized/-10101a Rosetta Mappings to LOINC supplemented for UOM conversion (prepared by Clem McDonald and Swapna Abhyankar) and
* The IHE PCD Rosetta Table which maps units of measure: MDC to UCUM codes

The source of truth for these mappings may or may not be in the RTMMS mapping database but would be accessible through a clinical terminology service or services in two forms for any clinical application actor (primarily a Device Observation Consumer, Clinical Data Consumer or Clinical Data Source):

1. A real time or near real-time query with inputs of a specific set of observations in IEEE 11073 format for return of the corresponding LOINC values or
2. An off-line retrieval of the actual mappings to enable the clinical application to do the data transformation.

##### X.4.2.1.2 Clinical Mapping (CMAP) Process Flow: Medical Vital Sign Observation Monitoring Discrete Data Retrospective Utilization

Clinical Mapping Requestor

Clinical Mapper

Translate Code

Clinical Mapping Requestor

Clinical Mapper

Retrieve Code   
Mappings

Figure X.4.1.2-1: Basic Process Flow in Clinical Mapping (CMAP) Profile for Medical Vital Sign Observation Monitoring Discrete Data Retrospective Utilization Use Case

#### X.4.2.2 Use Case #2: Creating Billing Documents From Clinical Encounter Documentation

##### X.4.2.2.1 Creating Billing Documents From Clinical Encounter Documentation Use Case Description

A patient visits his or her doctor for a scheduled ambulatory encounter. During the course of the encounter, the doctor documents relevant clinical facts about the patient in the EMR system. When documenting the patient’s problems, the EMR system assists the doctor to code each problem with appropriate codes selected from SNOMED-CT. SNOMED-CT has been chosen as the vocabulary most appropriate for coding problems and other clinical information, when used to support clinical care.

In the US, healthcare payers and other users of clinical data require that billing and reporting use codes for problems and other data elements from the ICD-10 terminology. In order to get paid for clinical data services delivered, the bill sent to the payer must have the appropriate ICD-10 codes substituted for the SNOMED-CT codes entered during the encounter. Following the encounter, the practice billing clerk creates a bill by extracting relevant data from the EMR system. Either the EMR system or the billing system has the capability to map from SNOMED-CT to ICD-10 codes for use in the bill. For most problems, the system uses its local map to identify the appropriate ICD-10 codes to substitute for the SNOMED-CT codes.

In cases where the system does not have a pre-assigned ICD-10 code to match the provided SNOMED-CT code, the billing clerk uses the Translate Code transaction to identify the correct code. The clerk submits the unmatched SNOMED-CT code to the mapping service – possibly including additional modifiers from the patient record, which are supplied automatically, to assist with mapping. If the mapping service needs additional modifiers, it queries the EMR or billing system to gather the required data elements. Once it has all required data, the mapping system returns the appropriate ICD-10 code for use by the billing system.

##### X.4.2.2.2: Clinical Mapping (CMAP) Process Flow: Creating Billing Documents From Clinical Encounter Documentation Use Case

Figure X.4.2.2-1: Basic Process Flow in Clinical Mapping (CMAP) Profile for Creating Billing Documents From Clinical Encounter Documentation Use Case

## X.5 Clinical Mapping (CMAP) Security Considerations

The process of Clinical Mapping need not contain personal health information (PHI). The specifications selected for the CMAP profile transactions do not typically include PHI, although context information (e.g., age, gender, or rare disease codes) could in fact represent PHI in certain contexts. Thus, implementers may wish to encrypt the communications channel using the IHE ATNA profile.

Services providing clinical mappings affect the content of patient records where translations of codes are being used. To ensure appropriate translations and verify the identity of these service providers, the service should be authenticated. Some services may be offered only to licensed users by vendors, and so the system accessing the service, or the user of the service should also be authenticated. The IHE ATNA profile offers capabilities for mutual system authentication. The IHE EUA, XUA and IUA profiles can be used to support individual user authentication.

The data and algorithms used to implement a translation service for clinical mappings represent a significant technical investment by providers of translation services. Those service providers may not be interested or willing to support distribution of the intellectual property which enables local implementation of translations without using a service. The Retrieve Code Mappings transactions is optional for this reason, enabling service users to access translations in a standard format, without enabling bulk download of the entire translation table.

Translating codes in real time as they are encountered within a system through the interfaces specified in this profile could result in excessive use of network bandwidth. This could especially be the case when translating remote monitoring data. Given that code translations are slowly changing resources, the protocol enables caching of responses, at both the application and lower levels.

## X.6 Clinical Mapping (CMAP) Cross Profile Considerations

This supplement provides the Device Observation Consumer with terminology services that facilitates the conversion of specific IEEE observation codes contained in the HL7 v2.6 message produced by the PCD-01: Communicate Device Data transaction into clinically usable LOINC and SNOMED. Use of LOINC and SNOMED is dependent on the dependent on the country or region. No change proposals are anticipated in the PCD-01 transaction at this time. Potential PCD involvement is anticipated only in the facilitation of easy data entry in devices to input the manually entered constraints, e.g. right arm vs. left arm.

**

Volume 2 – Transactions

Add section 3.Y

## 3.Y Translate Code [PCC-Y]

### 3.Y.1 Scope

This transaction is used to translate a code from one coding system to another.

### 3.Y.2 Actor Roles

Clinical Mapping Requestor

Actor ABC

Clinical Mapper

Figure 3.Y.2-1: Use Case Diagram

Table 3.Y.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Clinical Mapping Requester |
| **Role:** | An information system requesting a mapping of a code from one vocabulary to another. |
| **Actor:** | Clinical Mapper |
| **Role:** | An information system that responds to a mapping request |

### 3.Y.3 Referenced Standards

HL7 Fast Healthcare Information Resources (FHIR®) DSTU 2.0 Draft for Ballot

### 3.Y.4 Interaction Diagram

Clinical Mapping Requestor

Actor A

$translate

Message 1

Clinical Mapper

Actor D

#### 3.Y.4.1 Translate Code

The Translate Code transaction is implemented through the FHIR $translate operation on a ConceptMap resource. The details of this transaction are described below under Message Semantics. That operation defines a mechanism by which codes can be translated from one coding system to another.

##### 3.Y.4.1.1 Trigger Events

The Clinical Mapping Requester can request a code to be translated at several points in time:

1. It may periodically make requests for information on how to translate codes which will be saved and applied repeatedly during normal operation of the system.
2. It may receive information using a particular code and dynamically request translation of that code into a different coding system.

##### 3.Y.4.1.2 Message Semantics

The message is a FHIR operation with the input and output parameters shown below in Table 3.Y.4.1.2-1. The name of the operation is $translate, and it is applied to ConceptMap resources. It is sent synchronously in JSON format from the Clinical Mapping Requester actor to the Clinical Mapper actor using an HTTP or HTTPS GET request.

The URL for this operation is: [base]/ConceptMap/$translate

Where [base] is the base URL for the Clinical Mapper actor.

Table 3.Y-1 $translate Message Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Card. | Data Type | Description |
| **Input Parameters** | | | |
| code | 1..1 | code | The code to translate. |
| system | 1..1 | uri | The system for the code that is to be translated. |
| target | 1..1 | uri | A URI identifying the target value set from which the translated code should come from. |
| cmap:  dependsOn | 0..\* |  | Additional context may be necessary to identify a mapping. Each **dependsOn** parameter identifies some piece of context information that could be used to facilitate mapping. |
| cmap:  dependsOn.  element | 1..1 | uri | The element part of the parameter provides a reference to a model element holding a coded value from which the additional context information is obtained. This can be an element in a FHIR resource, a specific reference to a data element in a different specification (e.g. v2) or a general reference to a kind of data field, or a reference to a value set with an appropriately narrow definition. |
| cmap:  dependsOn.  codeSystem | 1..1 | uri | The code system in the referenced element. |
| cmap:  dependsOn.  code | 1..1 | string | Value of the referenced element |
| **Output Parameters** | | | |
| result | 1..1 | boolean | A value of true or false indicating whether a mapping could be performed. |
| message | 0..1 | string | Error details when result = false, warnings if result = true |
| equivalence | 0..1 | code | A code indicting the strength of the match. |
| outcome | 0..1 | Coding | The mapped code. |
| cmap:product | 0..\* |  | A mapping may produce additional context information. Each product parameter identifies some piece of context produced by a mapping. (see also dependsOn above). |
| cmap:product.  element | 1..1 | uri | A reference to a model element that would hold a coded value where the produced context is used. |
| cmap:product.  codeSystem | 1..1 | uri | The code system in the referenced element. |
| cmap:product.  code | 1..1 | string | The code produced as a result of the mapping. |
| cmap:  dependsOn | 0..\* |  | The dependsOn output parameter may be present to specify which additional dependencies should be specified to obtain a better match. |
| cmap:  dependsOn.  element | 1..1 | uri | The element part of the parameter provides a reference to a model element holding a coded value from which the additional context information would be obtained. |
| cmap:  dependsOn.  codeSystem | 1..1 | uri | The code system in the referenced element. |

##### 3.Y.4.1.3 Expected Actions

1. The Clinical Mapping Requester actor shall send a $translate request to the Clinical Mapper actor.
2. When the Clinical Mapper actor shall identify the appropriate mapping tables to apply to the $translate request.
3. If vocabulary mapping from the **system** to the **target** vocabulary is not supported (e.g., RxNORM to LOINC), the mapper shall return a **result** parameter of false. The **message** parameter should indicate that no translation is possible between the two vocabularies. The **dependsOn** or **product** parameters shall not be present in this case.
4. If vocabulary mapping from the **system** to the **target** vocabulary is supported,
   1. If the specified **code** can be mapped to a single codewithout any more context,
      1. The **outcome** parameter shall be set to the single code identified.
      2. The **result** parameter shall be set to true.
   2. If the specified code can be mapped to different multiple codes depending on additional context not already specified in the **dependsOn** parameter
      1. All additional contexts that support a better mapping shall be copied to the **dependsOn** output parameters.
      2. The **result** parameter shall be set to false.

### 3.Y.5 Security Considerations

<Description of the transaction specific security consideration; such as use of security profiles.>

#### 3.Y.5.1 Security Audit Considerations

<This section should identify any specific ATNA security audit event that is associated with this transaction and requirements on the encoding of that audit event. >

##### 3.Y.5.1.(z) <Actor> Specific Security Considerations

<This section should specify any specific security considerations on an Actor by Actor basis.>

## 3.Z Retrieve Code Mappings [PCC-Z]

### 3.Z.1 Scope

This transaction is used to retrieve the table used to perform code mapping.

### 3.Z.2 Actor Roles

Clinical Mapping Requestor

Actor ABC

Clinical Mapper

Figure 3.Z.2-1: Use Case Diagram

Table 3.Z.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Clinical Mapping Requester |
| **Role:** | An information system requesting the table of mappings from one code system to another. |
| **Actor:** | Clinical Mapper |
| **Role:** | An information system that responds to the request |

### 3.Z.3 Referenced Standards

HL7 Fast Healthcare Information Resources (FHIR®) DSTU 2.0 Draft for Ballot

### 3.Z.4 Interaction Diagram

Clinical Mapping Requestor

Actor A

ConceptMap Query

Message 1

Clinical Mapper

Actor D

#### 3.Z.4.1 Retrieve Code Mapping

The Retrieve Code Mapping transaction is implemented through the FHIR ConceptMap query operation.

##### 3.Z.4.1.1 Trigger Events

The Clinical Mapping Requester can request a the mapping table when it is preparing itself to map several codes from one coding system to another

##### 3.Z.4.1.2 Message Semantics

The message is a FHIR query requesting a ConceptMap resource using an HTTP GET and the source and target query parameters.

The URL for this operation is: [base]/ConceptMap?source=*sourceCodingURI*&target=*targetCodingURI*

Where [base] is the base URL for the Clinical Mapper actor.

##### 3.Z.4.1.3 Expected Actions

The Clinical Mapper actor will return all ConceptMap resources that support mapping from the coding system identified by *sourceCodingURI* to the coding system specified in *targetCodingURI*.

This transaction shall be supported by Clinical Mapper and Clinical Mapping Requester actors that declare support for the Retrievable Mappings Option.

### 3.Z.5 Security Considerations

Clinical Mapping tables often represent intellectual property that may only be available to licensed users. To protect this IP, the Clinical Mapper may require the channel over which the request is made to be encrypted, and the system making the request to be authenticated. The IHE ATNA profile can be used to provide these capabilities.

Volume 2 Namespace Additions

Add the following terms to the IHE General Introduction Appendix G:

<Please explicitly identify all new OIDs, UIDs, URNs, etc., defined specifically for this profile. These will be added to the IHE TF General Introduction namespace appendix when it becomes available. These items should be collected from the sections above, and listed here as additions when this document is published for Trial Implementation. This section will be deleted prior to inclusion into the Technical Framework as Final Text, but should be present for publication of Public Comment and Trial Implementation.>

# 5. Namespaces and Vocabularies

Add to section 5 Namespaces and Vocabularies

<Note that the code systems already defined in the Technical Framework of this domain may (but not required) be replicated here just to aid in the supplement review as a standalone document. Also note that the Section 5 table numbers and names are already defined in the TF Volume 3.>

| codeSystem | codeSystemName | Description |
| --- | --- | --- |
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |

Add to section 5.1.1 IHE Format Codes

| Profile | Format Code | Media Type | Template ID |
| --- | --- | --- | --- |
| <Profile name (profile acronym)> | <urn:ihe: > |  | <oids> |
|  |  |  |  |
|  |  |  |  |

Add to section 5.1.2 IHE ActCode Vocabulary

|  |  |
| --- | --- |
| Code | Description |
| <Code name> | <short one sentence description or reference to longer description (not preferred)> |
| <Code name> | <short one sentence description or reference to longer description (not preferred)> |
| <Code name> | <short one sentence description or reference to longer description (not preferred)> |

Add to section 5.1.3 IHE RoleCode Vocabulary

| Code | Description |
| --- | --- |
| <name of role> | <Short, one sentence description of role or reference to more info.> |
| <name of role> | <Short, one sentence description of role or reference to more info.> |
| <name of role> | <Short, one sentence description of role or reference to more info.> |