



U.S. Department of Health and Human Services
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OPPORTUNITIES FOR ENGAGING LONG-TERM AND POST-ACUTE CARE PROVIDERS IN HEALTH INFORMATION EXCHANGE ACTIVITIES:

EXCHANGING INTEROPERABLE PATIENT ASSESSMENT INFORMATION

APPENDIX C: ROSETTA STONE MAPPING GUIDELINES AND HEURISTICS

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1. PURPOSE

The purpose of this project is to:

1. Develop a Health Level Seven International (HL7) Clinical Document Architecture (CDA) framework for the federally mandated Minimum Data Set 3.0 (MDS3.0) for nursing homes. HL7 CDA Release 2 (CDA R2) is a document markup standard that specifies the structure and semantics of clinical documents for the purpose of electronic health information exchange. CDA provides a mechanism for incremental semantic interoperability. Application of this recognized standard to the MDS 3.0 and the home health Outcome and Assessment Information Set (OASIS-C) assessments will allow health care facilities to communicate assessment content in an interoperable, industry-standard format.
2. Map the federally mandated MDS3.0 and OASIS-C assessment instruments to the Systematized Nomenclature of Medicine -- Clinical Terms (SNOMED CT) and other health IT vocabularies.
3. Present the SNOMED CT mapped data in a format that supports:
 - a. Inbound receipt of semantically interoperable EHR content applicable to completion of the MDS3.0 or OASIS-C; and
 - b. Outbound movement of semantically interoperable assessment content to an HL7 CDA Questionnaire Assessment or Patient Summary Document using the adopted Continuity of Care Document (CCD) standard.

The MDS CDA Implementation Guide (IG):

The HL7 Implementation Guide for CDA R2: CDA Framework for Questionnaire Assessments (Universal Realm) and CDA Representation of the Minimum Data Set Questionnaire Assessment (U.S. Realm), Draft Standard for Trial Use (DSTU), Release 1 was published April 2009. This Implementation Guide specifies a standard for electronic submission of CDA questionnaire assessments that allows health care facilities to communicate assessment documents in an interoperable, industry-standard format.

While not yet published through HL7, a preliminary DSTU Update Release for this implementation guide, based on the CMS MDS3.0 data specifications v1.00.0, October 2009, has been created in conjunction with this study. All references in this heuristics document are to the Implementation Guide for CDA R2: CDA Framework for Questionnaire Assessments (Universal Realm) and CDA Representation of the Minimum Data Set Questionnaire Assessment (U.S. Realm) Draft Standard for Trial Use, **Update Release 2** (hereafter referred to as the MDS CDA implementation guide (IG)). In the future, we expect this Guide to be further refined.

2. HL7 CDA REPRESENTATION OF QUESTIONNAIRE ASSESSMENTS

HL7 created a preliminary DSTU update, the MDS CDA Implementation Guide, based on the CMS MDS3.0 data specifications v1.00.0, October 2009. The MDS CDA IG specifies a standard for electronic submission of CDA questionnaire assessments that allows healthcare facilities to communicate assessment documents in an interoperable, industry-standard format. The questionnaire assessments contain multiple questions with specific answers.

The MDS CDA IG defines both a required Model of Use (MoU) representation and an optional Model of Meaning (MoM) representation for each entry in the CDA Body. These models (described below) support both a faithful representation of the exact questions and answers on an assessment questionnaire and a semantically interoperable and reusable representation that encodes their meaning. In addition, the EHR system may have data to determine the answer to a particular form's question. In such a case, the relevant EHR data can be optionally included in the questionnaire instance as a Supporting Observation(s).

Re-Use of MDS & OASIS Data Through Interoperable, Industry Standard Formats

Model of Use (MoU):

MDS and OASIS concepts are represented using LOINC codes that have been developed to convey each question and answer precisely as it was captured on the assessment instrument.

Model of Meaning (MoM):

MDS and OASIS concepts are represented using standard vocabulary (e.g., SNOMED CT) and formal CDA clinical statement modeling.

Supporting EHR Observations:

MDS and OASIS concepts are represented as standard vocabulary value sets that support re-use of EHR content relevant to assessment questions.

- Model of Use (MoU) is the representation of question/answer data precisely in the form in which it was captured in the application of origin (i.e., the assessment instrument). A set of Logical Object Identifiers Names and Codes (LOINC) codes have been developed to represent each question and coded answer on the assessment questionnaire.
 - This MoU will support queries of the type "Find all patients with a Response of X to Question Y on Form Z."
 - See 1.13.1 -- Model of Use Base Pattern and 1.13.2 -- Model of Use Question and Answer Patterns for details on MoU representation in the MDS CDA IG.

- Model of Meaning (MoM) includes the representation of clinical data or concepts using standard vocabulary and formal CDA Refined Message Information Model (RMIM)-compliant clinical statement modeling. Some or all of the questions and responses on a form are amenable to partial or complete formal modeling using constructs provided by the HL7 Reference Information Model (RIM) coupled with standard terminologies. MoM representation is optional in this specification because many questions are not currently amenable to formal representation using standard terminologies.
 - This MoM will support queries of the type “Find all patients with Condition X, regardless of the form used to collect the data.”
 - See 1.13.3 -- Model of Meaning Representation for details on MoM representation in the MDS CDA IG.
- Supporting EHR Observations -- Existing electronic health record (EHR) data may be relevant to making the decision about how to answer a particular form's question. In such a case, the MDS CDA IG defines how to optionally include “supporting observations” in the questionnaire instance.
 - See 1.13.4 -- Supporting Observations for details on supporting EHR observation representation in the MDS CDA IG.

3. ROSETTA STONE

The Rosetta Stone spreadsheet was designed as a tool to assist health IT vendors of long-term care EHR products in the transition to using LOINC, SNOMED CT and other standard vocabularies as the terminology of choice for the documentation and conveyance of MDS 3.0 (based on CMS MDS3.0 data specifications v1.01.0, December 2010) and OASIS-C (based on CMS OASIS-C data specifications v2.00, Revision 3, October 2009) assessment content. The use of these health IT standards should be transparent to the end user and the assessment content they are accustomed to seeing would remain unchanged. However, the software application would be enhanced to map the assessment content to standard vocabularies to support interoperable exchange and reuse of the assessment content. The Rosetta Stone is a tool that can be used for various mapping scenarios:

CMS Data Specifications:

Several updates to the CMS MDS3.0 Data Specifications were released over the course of this project. It was out of scope for this project to revise deliverables based on data specification updates released following completion of a tool. Such updates will need to be addressed in the future.

MDS tools created for this study are based on the CMS data specifications as listed below:

- MDS CDA Implementation Guide Update Release 2: used CMS MDS3.0 data specifications v1.00.0, October 2009
- MDS Rosetta Stone: used CMS MDS3.0 data specifications v1.01.0 December 2010
- OASIS Rosetta Stone: used CMS OASIS-C data specifications v2.00, Revision 3, October 2009

- a. **Map from MDS3.0 or OASIS-C in CMS format to corresponding Model of Use LOINC representation:** In this scenario, for each MDS3.0 or OASIS-C question and answer, there is a corresponding LOINC question and answer code, respectively. For MDS3.0 questions and answers, the CDA pattern to be used when communicating the assessment items in CDA format is also listed. For this scenario, see the Rosetta Stone "Model of Use" tab in the attached Excel spreadsheet.
- b. **Map from MDS3.0 or OASIS-C in CMS format to corresponding Model of Meaning representation:** In this scenario, for each MDS3.0 question and answer mappable to a standard terminology, there is a corresponding semantically complete representation, based on a complete modeling of the question against the HL7 Reference Information Model, coupled with codes from a standard terminology such as SNOMED CT or code sets such as ICD-9-CM or CVX. For OASIS-C questions and answers, there is a corresponding code from a standard terminology such as SNOMED CT or code set such as CVX.

MDS3.0 and OASIS-C data elements were also evaluated against other standard terminologies such as RxNorm. However, these other terminologies were not compatible with the data captured in these CMS standardized assessment instruments.

For this scenario, see the Rosetta Stone “Model of Meaning” tab in the attached Excel spreadsheet for the semantic representation of MDS or OASIS questions and answers.

- c. **Map from EHR data element to MDS3.0 element to facilitate semi-automated population of assessments from EHR data:** In this scenario, one uses the Rosetta Stone "Supporting EHR Observation" tab and corresponding Access database of "Value Set Members". Where a SNOMED-encoded finding, ICD-9-CM code or ICD-10-CM code in the EHR maps into one of the value sets, it suggests the presence of EHR data that could be used to help fill in the corresponding MDS question.

Note: Under this scope of work, value sets were only created for MDS3.0 Section I (Active Diagnoses) data elements. Additional work is needed to identify value sets for OASIS-C data elements and data elements for other sections of the MDS3.0.

A separate “Rosetta Stone” has been created for the MDS3.0 and the OASIS-C assessment instruments. Each Rosetta Stone is a spreadsheet with an Overview describing the content of the spreadsheet, and separate tabs for Model of Use and Model of Meaning content. The Rosetta Stone for the MDS3.0 also has a “Supporting EHR Observations” tab for Section I (Active Diagnoses) value sets as described above.

4. MAPPING METHODOLOGY

4.1. Model of Meaning (MoM) Tab -- Minimum Data Set 3.0/OASIS-C to SNOMED CT Mapping

The MDS3.0 and OASIS-C consist of individual sections containing a series of questions and corresponding answers. Each of the MDS3.0 and OASIS-C data elements contains a coding schema that links a document section to the questions and answers for that section.

General principles guiding the mapping of MDS3.0 and OASIS-C data elements to SNOMED CT include:

1. Data elements are mapped to active SNOMED CT concepts (SNOMED CT Concept Status code "0").
2. The MoM tab reflects the best SNOMED CT Fully Specified name (FSN) or its proximal parent code.
3. The approach to mapping the OASIS and MDS content is at the level of the answered question, with a primary focus on showing how the completed form is to be represented.
4. A one-to-one SNOMED CT mapping is selected whenever possible

| EXAMPLE: | |
|----------------------------------|---|
| MDS3.0 Data Element: | B0600-2 -- No speech -- absence of spoken words |
| SNOMED CT Concept ID: | 286371003 |
| SNOMED CT FSN: | Does not speak (finding) |
| SNOMED CT Best Match on MoM tab: | 286371003 -- Does not speak (finding) |

5. If a one-to-one mapping is not available, the data element is mapped to the SNOMED CT proximal parent that includes all of the possible descendent data elements necessary to represent the MDS/OASIS concept.

Some MDS/OASIS data elements embody more than one concept (e.g. MDS item I4500 (CVA, TIA, or stroke)). When a one-to-one mapping to SNOMED CT is not available, the data element is mapped to the SNOMED CT code that best represents all concepts embodied in the MDS/OASIS data element.

| EXAMPLE: | | |
|--|--|---|
| MDS3.0 Data Element: | I4500 -- Cerebrovascular accident (CVA), TIA, or stroke) | |
| SNOMED CT Concept ID #1 -- "CVA": SNOMED CT FSN #1: | 230690007 cerebrovascular accident (disorder) | Child concept to "cerebrovascular disease (disorder)" |
| SNOMED CT Concept ID #2 -- "TIA": SNOMED CT FSN #2: | 266257000 transient ischemic attack (disorder) | Child concept to "cerebrovascular disease (disorder): |
| SNOMED CT Concept ID #3 -- "stroke": SNOMED CT FSN #3: | 230690007 cerebrovascular accident (disorder) | Child concept to "cerebrovascular disease (disorder): |
| <i>SNOMED CT Best Match on MoM tab:</i> | 62914000 -- cerebrovascular disease (disorder) | "Cerebro-vascular disease (disorder)" -- parent concept for CVA and TIA |

6. If no comparable SNOMED CT concept is available for either 1:1 equivalent or most proximal parent mapping, the "Comment" column reflects the reason the data element could not be mapped.

MDS and OASIS items that are not mapped to SNOMED CT would be represented by LOINC codes found in the MoU tab.

7. Unique SNOMED CT codes SHALL be used for the question and associated answer(s).

Representing the structure/content of an assessment item in SNOMED CT will require the use of one of the following coding techniques:

1. Use of a single SNOMED CT code that fully represents the patient's status in terms of the question/answer pair (see example in Section 4.1.1 "Rules for SNOMED CT Mapping Using an Assertion Pattern"), or
2. Use of two SNOMED CT codes: a SNOMED CT code to represent the question and a SNOMED CT code to represent the patient's performance as measured by the answer (see example below).

| EXAMPLE: | |
|--|---|
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Question: J0400 (Res pain interview: frequency) 364631005 pattern of pain (observable entity) |
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: J0400-1 (Almost constantly) 255238004 continuous (qualifier value) |
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: J0400-2 (Frequently) 70232002 frequent (qualifier value) |
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: J0400-3 (Occasionally) 84638005 occasional (qualifier value) |
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: J0400-4 (Rarely) 89292003 rare (qualifier value) |

8. The same SNOMED CT code MAY be used for more than one response to a question.

| EXAMPLE: | |
|--|--|
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Question: B0700 (Makes self understood) 288743004 ability to make self understood (observable entity) |
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: B0700-0 (Understood) 288746007 does make self understood (finding) |
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: B0700-1 (Usually understood -- difficulty communicating some words or finishing thoughts but is able if prompted or given time) 288748008 difficulty making self understood (finding) |
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: B0700-2 (Sometimes understood -- ability is limited to making concrete requests) 288748008 difficulty making self understood (finding) |
| MDS3.0 Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: B0700-3 (Rarely/never understood) 288747003 does not make self understood (finding) |

9. SNOMED CT grouper concepts SHALL NOT be used to represent the answer to a question if possible

| EXAMPLE: | | |
|---|--|--|
| OASIS-C Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Question: M1100_PTNT_LVG_STUTN (Patient Living Situation) 224209007 residence and accommodation circumstances (observable entity) | |
| OASIS-C Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: 1 (Patient Lives Alone -- Around the clock) 105529008 lives alone (finding) | DO NOT code to SNOMED CT parent concept: 365508006 -- finding of residence and accommodation circumstances (finding). This is a grouper concept. |
| OASIS-C Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: 6 (Patient Lives with Other Person -- Around the clock) 160724009 independent housing, not alone (finding) | |
| OASIS-C Data Element: SNOMED CT Concept ID: SNOMED CT FSN: | Response: 11 (Patient Lives in Congregate Situation -- Around the clock) 105530003 living in residential institution (finding) | |

10. MDS3.0 or OASIS-C demographic data elements:

- SHALL NOT be mapped to a SNOMED CT concept if they are mapped to a CDA Header element. For example:
 - MDS3.0 Data Elements: A0600A (Social Security Number)
A0900 (Birthdate)
- SHALL NOT be mapped to a SNOMED CT concept if the MDS CDA IG instructs that the data element be coded to another code sets. For example:
 - The MDS CDA IG recommends the use of HITSP-recognized HL7 administrative gender codes
 - The MDS CDA IG maps the MDS marital status responses to the HITSP-recognized HL7 marital status codes
 - The MDS CDA IG uses the Ethnicity pattern, modeled per HITSP recommendations, where observation/value is drawn from CDC Race and Ethnicity Code Set
- SHALL NOT be mapped to SNOMED CT concept if there is no clear relevance/usefulness to other care providers/clinicians. For example:
 - MDS3.0 Data Element: A0310A (Type of assessment: OBRA)

Summary: SNOMED Representations in the Model of Meaning Tab

Available SNOMED representations for the MDS and OASIS are found column G (SNOMED CT code) and column H (SNOMED CT Fully Specified Name) of the Model of Meaning tab in the respective Rosetta Stones. These Rosetta Stones also identify the primary reason that an assessment item is not mapped to a SNOMED concept (see column G in the respective MoM tab). The following statements are used to indicate the reason a concept is not mapped to SNOMED CT.

- *Concept Not Mapped --*
 - This demographic/administrative data element is mapped to the CDA Header or is not relevant/useful to other providers/clinicians
 - No comparable SNOMED CT concept is available for either 1:1 equivalent or most proximal parent mapping
 - Data element is a complex expression that is not mappable to a single SNOMED CT concept and requires post coordination*
 - Negated/frequency/qualifier data elements is addressed through the vendor information model or in the CCD
 - Ambiguous concepts such as "none", "other", "unknown", etc., cannot be mapped to SNOMED CT
 - Question responses are free text format and do not provide a fixed concept for SNOMED CT mapping

***NOTE:** This study did not undertake activities to post-coordinate complex, compound MDS data elements.

See Section 6 below for examples of MDS and OASIS data elements relevant to each of the "Concept Not Mapped" statements below.

4.1.1. MoM Tab -- Rules for SNOMED-CT Mapping of MDS3.0/OASIS-C Data Elements

A variety of question/answer formats are found in the MDS3.0 and OASIS-C assessment instruments. Two techniques were used in mapping SNOMED CT concepts for these various question/answer formats:

- Assertion Pattern
- Question/Answer Pattern

Assertion Pattern

1. Typically, MDS and OASIS questions that are in a “yes/no” or “check all that apply” format” are represented using an “assertion pattern”.
2. In an assertion pattern, **the question itself is not mapped** to SNOMED CT, only the response is represented (e.g. “the resident is comatose”, “the resident does not use hearing aid”).
3. The SNOMED CT hierarchies used for mapping “assertion patterns” differ slightly from the hierarchies used to map data elements in a “question/answer pattern”.

Rules for SNOMED CT Mapping Using an Assertion Pattern

For items with a CDA MoM representation of “assertion pattern” (typically questions in a “yes/no” or “check all that apply” format):

1. The question SHALL NOT be mapped to SNOMED-CT
2. The answers SHALL be mapped to the following SNOMED CT hierarchies:
 - Clinical Findings
 - Situation with Specific Context
 - Procedure

EXAMPLE #1 -- Assertion Pattern (yes/no question format):

1. MDS 3.0 Question B0100 "Comatose"
 - Answer = "No" (B0100-0) -- 271591004 -- Fully conscious (finding)
 - Answer = "Yes" (B0100-1) -- 371632003 -- Coma (disorder)

EXAMPLE #2 -- Assertion Pattern (check all that apply format):

- MDS 3.0 Item B0900A (Staff asmt mental status: recall current season) -- 225033002 -- Memory recall finding (finding)
- MDS 3.0 Item B0900B (Staff asmt mental status: recall location of room) -- 165287001 -- Memory: present place known (finding)
- MDS 3.0 Item B0900C (Staff asmt mental status: recall staff names/faces) -- 285227006 -- Able to remember faces (finding)
- MDS 3.0 Item B0900D (Staff asmt mental status: recall in nursing home) -- 165287001 -- Memory: present place known (finding)

Question/Answer Pattern

1. Typically, MDS and OASIS questions that are answered by means of a scale (e.g., 1=adequate, 2=slightly impaired) are represented using a "question/answer pattern".
2. Both the question and answer(s) are mapped to SNOMED CT.
3. The SNOMED CT hierarchies that can be used for mapping questions in a "question/answer" pattern differ slightly from the hierarchies used to map answers in a "question/ answer" pattern.

Rules for SNOMED CT mapping using a Question/Answer Pattern

For items with a CDA MoM representation of "question/answer pattern" (typically questions that have some type of 'scale' for the response (i.e., 1=x, 2=y, etc.):

1. The question SHALL be mapped to the following SNOMED-CT hierarchies:
 - Observable Entity
 - Procedure
2. The answers MAY be mapped to the following SNOMED CT hierarchies:
 - Clinical Findings
 - Qualifier
 - Procedure
 - Situation with Specific Context

EXAMPLE:

1. MDS 3.0 Question B0200 "Hearing" -- 364019009 -- Ability to hear (observable entity)
 - Answer = "Adequate" (B0200-0) -- 16233902 -- Hearing Normal (finding)
 - Answer = "Minimal Difficulty" (B0200-1) -- 162340000 -- Hearing difficulty (finding)
 - Answer = "Moderate Difficulty" (B0200-2) -- 425091001 -- Difficulty hearing normal speech tones (finding)
 - Answer = "Highly Impaired" (B0200-3) -- 306972000 -- Unable to hear loud voice (finding)

4.2. EHR Observation Tab --- Minimum Data Set 3.0 to SNOMED CT, ICD-9-CM and ICD-10 Mappings

For this project, value sets containing a collection of ICD-9-CM, ICD-10-CM and SNOMED CT codes that could support a given MDS response have been identified for each item in MDS3.0 Section I (Active Diagnoses). For example, the ICD-9-CM value set for MDS item I0100 (Cancer) includes all codes in the range 140-239. The presence of an ICD-9-CM code within this range in the patient's EHR could flag the user to assess if response I0100 should be marked on the MDS assessment.

For purposes of this project, SNOMED CT, ICD-9-CM and ICD-10 value sets have been developed for data elements in MDS 3.0 Section I (Active Diagnoses) only. Value

sets have not been developed for data elements in other sections of the MDS 3.0 or for the OASIS-C.

1. General principles guiding the value set mapping for SNOMED CT include the following:
 - Value sets are developed at the question level only and are mapped to the following SNOMED CT hierarchies
 - Clinical finding
 - Situation with explicit context
 - The questions are equivalent to the assertion patterns or question/answers patterns in the Rosetta Stone Model of Meaning tab. The value set consist of variations of the Model of Meaning concepts.

EXAMPLE:

| |
|---|
| <p>MDS 3.0 Data Element I3700 -- Arthritis (e.g., degenerative joint disease (DJD), osteoarthritis, and rheumatoid arthritis (RA))</p> <ul style="list-style-type: none">• Association/Model of meaning: Arthropathy (disorder) Concept ID 399269003• Value Set: Osteoarthritis (disorder) 396275006 Arthritis (disorder) 3723001 Decedents of Arthropathy (disorder) CID 399269003 within SNOMED CT |
|---|

2. The value set mapping for ICD-9-CM and ICD-10-CM identifies relevant codes for the specified conditions found in the 2011 releases of the classification systems.

4.2.1. EHR Observation Tab -- Rules Used for the Development of SNOMED CT Value Sets

The Model of Meaning concept has been imported to the International Health Terminology Standards Development Organization (IHTSDO) Workbench mapping tool with intentional definition rules used to select the appropriate children concept nodes that relate to the Model of Meaning. Those nodes have been extracted and placed into an Access database. The Access database links the MoM to the valueset_name by clicking on the name within the database. The value set consists of the MDS description, MDS code, SNOMED CT concept ID (CID), the Fully Specified Name (FSN) and a comment column.

MDS Section I value set rules used include:

- Select ALL concepts that are:
 - Descendents of XXXXX
OR
 - Descendents of YYYYYY
AND
 - NOT Descendents of ZZZZZZ

- Concepts come from the following hierarchies:
 - Clinical Findings
 - Situation with specific context

- Any “history of XX” OR “family history of XX” are excluded from the SNOMED CT situation of specific context hierarchy

5. ROSETTA STONE POPULATION

CAP-STS was responsible for entering only the SNOMED CT related concept mappings onto the Rosetta Stone and Value Set spreadsheets, including:

- Model of Meaning Tab (MDS Rosetta Stone) -- all items in MDS sections A - Q
 - Column G (SNOMED CT Code)
 - Column H (SNOMED CT FSN)

- Supporting EHR Observation Tab (MDS Rosetta Stone) -- MDS Section I (Active Diagnoses) items
 - Column F (SNOMED CT Value Set Name)
 - Column G (SNOMED CT Value Set File Name)

- MDS Section I Value Set database with its corresponding value set spreadsheets

- Model of Meaning Tab (OASIS Rosetta Stone) -- all OASIS items
 - Column G (SNOMED CT Code)
 - Column H (SNOMED CT FSN)

Preliminary SNOMED CT mappings were assigned by CAP-STS to each MDS3.0 and OASIS data element. The SNOMED mappings were then validated with an MDS/OASIS subject matter expert in an item-by-item review process. Any discrepancies were either resolved or referred to a semantic matching expert for additional guidance and final mapping resolution.

5.1. Ongoing Maintenance of SNOMED Mapping

Ongoing maintenance should be performed to keep the assessment mappings up to date with: (i) new releases of the standard terminologies, and (ii) new versions of assessment instruments. The table below shows the release schedules for SNOMED CT.

| Terminology | Update Cycle | When | When |
|-------------|--------------|------|------|
| SNOMED CT | 2 x yr | Jan | July |

6. COMMENTS USED FOR MDS CONCEPTS NOT MAPPABLE TO SNOMED CT

For MDS/OASIS concepts that do not have an equivalent/proximal parent mapping to SNOMED CT, the following comments have been used in the Rosetta Stones (MoM tab, column G) to illustrate why the concept is not mappable.

| Rosetta Stone Comment | Concept Not Mappable -- MDS Example | Concept Not Mappable -- OASIS Example |
|---|---|---|
| <i>Concept Not Mapped (Reason #1)</i> -- This demographic/ administrative data element is mapped to the CDA Header or is not relevant/useful to other providers/clinicians. | A0310A -- Type of assessment: OBRA | M0010_CCN CMS Certification Number |
| <i>Concept Not Mapped (Reason #2)</i> -- No comparable SNOMED CT concept is available for either 1:1 equivalent or most proximal parent mapping. | H0400 -- Frequently incontinent (2 or more episodes of bowel incontinence, but at least one continent bowel movement) | M1055_PPV_RSN_NOT_RCVD_AGENCY Not indicated; patient does not meet age/condition guidelines for PPV |
| <i>Concept Not Mapped (Reason #3)</i> -- Data element is a complex expression that is not mappable to a single SNOMED CT concept and requires post coordination.* | K0100C -- Swallow disorder: cough/choke with meals/meds | M1100_PTNT_LVG_STUTN Patient Lives Alone - Around the clock M2040_PRIOR_MGMT_ORAL_MDCTN Prior Med Mgmt: Oral Medications |
| <i>Concept Not Mapped (Reason #4)</i> -- Negated/ frequency/qualifier data elements addressed through the vendor information model or in the CCD. | G0400A -- No impairment | M1240_FRML_PAIN_ASMT No standardized assessment conducted |
| <i>Concept Not Mapped (Reason #5)</i> -- Ambiguous concepts such as "none", "other", "unknown", etc., cannot be mapped to SNOMED CT. | P0100D -- Restraints used in bed: other | M1410_RESPTX_NONE Respiratory Treatments: None of the Above |
| <i>Concept Not Mapped (Reason #6)</i> -- Question responses are free text format and do not provide a fixed concept for SNOMED CT mapping. | A1100B -- Preferred language | M1016_CHGREG_ICD1 Regimen Change in Past 14 Days: ICD Code 1 |
| * NOTE: This study did not undertake activities to post-coordinate complex, compound MDS data elements. | | |

7. RESOURCES

| | |
|---|---|
| CMS Minimum Data Set 3.0 (MDS3.0) | <p>MDS3.0:</p> <ul style="list-style-type: none">• Maintained by the Centers for Medicare and Medicaid Service (CMS)• Updated as needed• Data specifications can be accessed at http://www.cms.gov/NursingHomeQualityInits/30_NHQIMDS30TechnicalInformation.asp |
| CMS Outcome & Assessment Information Set (OASIS-C) | <p>OASIS-C:</p> <ul style="list-style-type: none">• Maintained by the Centers for Medicare and Medicaid Service (CMS)• Updated as needed• Data specifications can be accessed at http://www.cms.gov/OASIS/04_DataSpecifications.asp |
| Codes for Vaccine Administered (CVX) | <p>CVX codes:</p> <ul style="list-style-type: none">• Are maintained by CDC’s National Center of Immunization and Respiratory Diseases (NCIRD)• Are updated as needed• Can be accessed at http://www2a.cdc.gov/nip/IIS/IISStandards/vaccines.asp?rpt=cvx |
| International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) | <p>ICD-9-CM codes:</p> <ul style="list-style-type: none">• Are maintained by the National Center for Health Statistics (NCHS) and the Centers for Medicare and Medicaid Services• Are updated in October (yearly) and April (if needed)• Can be accessed at http://www.cdc.gov/nchs/icd/icd9cm.htm |
| International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) | <p>ICD-10-CM codes:</p> <ul style="list-style-type: none">• Are maintained by the National Center for Health Statistics (NCHS)• Are not valid for any purpose or use until October 1, 2013 (effective date per HIPAA requirements)• Can be accessed at http://www.cdc.gov/nchs/icd/icd10cm.htm |
| Logical Object Identifiers Names and Codes (LOINC) | <p>LOINC codes:</p> <ul style="list-style-type: none">• Are maintained by Regenstrief Institute, Inc.• Are updated as needed• Can be accessed through the Regenstrief LOINC Mapping Assistant (RELMA) at http://loinc.org/relma |
| Standardized Nomenclature of Medicine - Clinical Terms (SNOMED CT) | <p>SNOMED CT codes:</p> <ul style="list-style-type: none">• Are maintained by the International Health Terminology Standards Development Organisation (IHTSDO)• Are updated twice a year in January and July• Can be accessed through a variety of free browsers listed by the Unified Medical Language System (UMLS) at http://www.nlm.nih.gov/research/umls/Snomed/snomed_main.html |

OPPORTUNITIES FOR ENGAGING LONG-TERM AND POST-ACUTE CARE PROVIDERS IN HEALTH INFORMATION EXCHANGE ACTIVITIES: EXCHANGING INTEROPERABLE PATIENT ASSESSMENT INFORMATION

Files Available for This Report

| | |
|---|---|
| Main Report | [54 PDF pages] http://aspe.hhs.gov/daltcp/reports/2011/StratEng.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng.pdf |
| APPENDIX A: Stakeholder Interview Summary | [13 PDF pages] http://aspe.hhs.gov/daltcp/reports/2011/StratEng-A.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-A.pdf |
| APPENDIX B: Background Report on Intellectual Property Issues and the Dissemination of Standardized Federally-Required Patient Assessments | [89 PDF pages] http://aspe.hhs.gov/daltcp/reports/2011/StratEng-B.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-B.pdf |
| APPENDIX C: Rosetta Stone Mapping Guidelines and Heuristics | [19 PDF pages] http://aspe.hhs.gov/daltcp/reports/2011/StratEng-C.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-C.pdf |
| APPENDIX D: Rosetta Stone MDS and OASIS and Value Sets for MDS Full Appendix | [518 PDF pages] http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D.pdf |
| Toolkit Overview, Model of Use, Model of Meaning, and Supporting EHR Observation [135 PDF pages] | http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D1.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D1.pdf http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D1.xlsx |
| MDS Value Sets (Separate Excel files accessible through links within HTMLs and PDFs) [381 PDF pages] | |
| <i>Alzheimer's Disease through Cirrhosis</i> [184 PDF pages] | http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D2a.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D2a.pdf |
| <i>Coronary Artery Disease through Wound Infection</i> [197 PDF pages] | http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D2b.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-D2b.pdf |
| APPENDIX E: Rosetta Stone OASIS | [71 PDF pages] http://aspe.hhs.gov/daltcp/reports/2011/StratEng-E.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-E.pdf http://aspe.hhs.gov/daltcp/reports/2011/StratEng-E.xlsx |
| APPENDIX F: Current Standards Landscape for Exchanging Interoperable Patient Assessment Information | [9 PDF pages] http://aspe.hhs.gov/daltcp/reports/2011/StratEng-F.htm http://aspe.hhs.gov/daltcp/reports/2011/StratEng-F.pdf |

APPENDIX G: LTPAC Interoperability Toolkit for Exchanging Interoperable Patient Assessment Instruments [9 PDF pages]
Overview <http://aspe.hhs.gov/daltcp/reports/2011/StratEng-G.htm>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-G.pdf>

Several attachments are listed separately at the end of this Appendix.

APPENDIX H: Standards Development and Adoption Recommendations [6 PDF pages]
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-H.htm>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-H.pdf>

APPENDIX I: Functional Status Standardization Recommendations [13 PDF pages]
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-I.htm>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-I.pdf>

APPENDIX J: Overview of Patient Assessment Summary [23 PDF pages]
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-J.htm>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-J.pdf>

APPENDIX K: Rosetta Stone MDS Summary [162 PDF pages]
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-K.htm>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-K.pdf>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-K.xlsx>

APPENDIX L: Rosetta Stone OASIS Summary [127 PDF pages]
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-L.htm>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-L.pdf>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-L.xlsx>

APPENDIX M: Terms and Acronyms [6 PDF pages]
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-M.htm>
<http://aspe.hhs.gov/daltcp/reports/2011/StratEng-M.pdf>

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U.S. Department of Health and Human Services
Office of Disability, Aging and Long-Term Care Policy
Room 424E, H.H. Humphrey Building
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Email: webmaster.DALTCP@hhs.gov

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