Optimizing Data Representation Through the Use of SNOMED CT

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Electronic health records (EHR) have changed the landscape for data representation. For many years health information management (HIM) professionals have relied on classifications for data representation and the support of clinical documentation. SNOMED CT is a data standard frequently used in electronic systems and has been included in the requirements for the Centers for Medicare and Medicaid Services' (CMS) "meaningful use" EHR Incentive Program. SNOMED CT is maintained and distributed by the International Health Terminology Standards Development Organisation (IHTSDO). SNOMED CT is recognized throughout the world, and the terminology is available at no cost. The National Library of Medicine (NLM) serves as the US release center and the IHTSDO member country representative.

Using SNOMED CT in electronic systems enables communication in a common medical language. Although some may remark that SNOMED CT is complex and difficult, it is important to understand that the terminology works in concert with software applications. By leveraging software the terminology can be transparent and nearly ubiquitous to clinicians by employing interface terminology applications.

SNOMED CT is a terminology designed for computer systems to support data representation tasks and EHR systems needing human management at designated times. SNOMED CT provides a way to represent data so it can be retrieved and analyzed —often the data is needed for documentation or information sharing between clinicians and other end users. SNOMED CT concepts are not assigned by humans as it is designed to work in computer system environments. Software developers must consider ways to best leverage the terminology in software application design so that the information that is represented is done in a useful way for end users.

SNOMED CT uses concepts to represent clinical ideas to form the basis of its structure. Concepts are organized into hierarchies which span from general to specific. The following are examples of hierarchies: Clinical Findings, Procedure, Observable Entity, Body Structure, Organism, Substance, Pharmaceuticals, and so forth.

The concepts are associated with a fully specified name, a set of descriptions that represent the same concept (i.e., synonyms), and a set of relationships to other concepts that can be processed electronically. Numbers are used to represent the concepts and are known as ConceptIDs. The ConceptIDs do not mean anything to humans but are integral to the terminology functionality in electronic environments. The concepts are embedded within EHRs to encode and aggregate the detailed clinical information documented within the health record.

SNOMED Makes EHRs More Meaningful

SNOMED CT has been adopted as one of the vocabulary standards for representing electronic health information that is used to meet stage 2 meaningful use requirements.

The following stage 2 meaningful use items identify SNOMED CT as a vocabulary standard:[1]

1. Common Data Set: smoking status, problems, and procedures[2,3]
2. Stage 2 Core Objective for eligible professionals, eligible hospitals, and critical access hospitals (CAHs) related to the summary care record for each transition of care or referral: encounter diagnoses, problem list
3. Stage 2 Core Objective for eligible hospitals related to the capability to submit electronic reportable lab results to public health agencies

4. Stage 2 Menu Objective for eligible providers, eligible hospitals, and critical access hospitals related to recording patient family health history as structured data
5. Stage 2 Menu Objective for eligible providers related to the capability to identify and report cancer cases to a central public health cancer registry

The reporting of clinical quality measures (CQMs) has been included in the definition of meaningful use. All eligible providers, hospitals, and critical access hospitals, beyond the first year of demonstrating meaningful use, must report CQMs as electronic data. CMS directs that CQM data will be captured in compliance with the Data Elements Catalog. In the Data Element Catalog of the NLM, each measure required for capture in EHR technology certified under the Office of the National Coordinator for Health IT's Health Information Technology Standards and Certification criteria, 2014 edition, is listed with its standard vocabulary.[4] Aspirin prescribed at discharge for acute myocardial infarction and ischemic stroke discharged on anti-thrombotic therapy use SNOMED CT as a vocabulary standard to capture data necessary to calculate the CQM for eligible hospitals.

SNOMED CT's Impact on Managing Health Information

SNOMED CT is an expressive terminology that is capable of recording and storing what a clinician wants to document at a granular level in an encoded method. The clinical documentation is electronically captured at a detailed level with the standard terminology rather than asking clinicians to capture clinical facts into broader classification categories.

For example, a family history of stenosis of the aortic valve can be specifically captured within SNOMED CT. However in the ICD-10-CM classification system, the same concept is captured at a broader level of family history of ischemic heart disease and other disease of the circulatory system.

The use of SNOMED CT in recording clinical information has some very obvious and specific benefits:[5]

- Enables the consistent retrieval, transmission, and analysis of data from patient records across healthcare systems
- Structured for precise recording of clinical information
- Designed as an international standard that allows for consistency and multilingual support across cultures

Depending on your needs, there are some very practical uses for SNOMED CT data:

- Facilitates point of care decision support by automatic identification of patient risk factors, and monitoring response of treatment and adverse reactions
- Identifies patients who match a given set of clinical criteria
- Enables patient data to be recorded by different people in different locations and can be combined to summarize a patient's care
- Enables detailed capture of clinical information at a level of detail that is appropriate and meaningful for healthcare providers
- Allows for easy data analysis to evaluate outcomes, performance related measures and process improvement activities by monitoring clinical events and activities

SNOMED CT allows for the standard capture of clinical information recorded by different providers in different places. This ensures continuity of care through many different care settings as the health record is passed from provider to provider. Patient records can be efficiently queried to identify and retrieve relevant information whether needed for research studies, decision support, or quality improvement.

SNOMED CT is important for HIM professionals to know since it has become a standard terminology embedded in EHRs. Knowing the locations of SNOMED CT codes within an EHR is important to support the various benefits of the terminology. An industry focus is capturing a patient's problem list encoded with SNOMED CT. Knowing the EHR contains SNOMED CT encoded problems facilitates data retrieval and analytics.

Another important reason for a HIM professional's awareness is understanding if and how SNOMED CT is mapped. Cross mapping from SNOMED CT to other terminologies and classifications is possible for some use cases. Knowing the data flow within an organization is important to ensure it is occurring as desired. Maps can play a large role in the data flow.

The National Library of Medicine provides an application to support problem lists called I-Magic Mapper using ICD-10-CM (available at http://imagic.nlm.nih.gov/imagic/code/map) and IHTSDO provides an official map between SNOMED CT and ICD-10. Reviewing these tools in light of the organization's use case ensures the maps support the desired data flow.

SNOMED CT is a robust terminology that can represent clinically relevant information consistently, reliably, and comprehensively in EHRs. While the healthcare industry continues to evolve in using multiple standard terminologies, SNOMED CT plays a large role due to noted benefits. HIM professionals need to be aware of its capabilities to effectively utilize it within their own organizations.

Notes

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Read More

Benefits and Uses of SNOMED CT
http://www.ihtsdo.org/snomed-ct/whysnomedct/benefits/

Visit the IHTSDO website for a comprehensive SNOMED CT explanation and a list of its benefits and uses in healthcare.

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Article citation:
Bronnert, June; Daube, Julie L; Jopp, Gretchen; Peterson, Kathleen; Rihanek, Theresa; Scichilone, Rita A; Tucker, Vanna. "Optimizing Data Representation Through the Use of SNOMED CT" *Journal of AHIMA* 85, no.3 (March 2014): 48-50.