SNOMED CT Integral Part of Quality EHR Documentation

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The use of many distinct standardized clinical vocabulary terminologies and classifications is integral to the development of a nationwide health IT infrastructure that allows for electronic use and exchange of health information. SNOMED CT is one of the key clinical terminologies designated for use in certified electronic health record (EHR) systems. SNOMED CT captures and represents patient data in the EHR for clinical purposes, rather than for reimbursement and other administrative purposes where the use of medical code sets (i.e., ICD-9-CM, ICD-10-CM, CPT) adopted under the HIPAA 5010 electronic transaction standards is more appropriate.

According to the International Health Terminology Standards Development Organization (IHTSDO), "SNOMED CT provides the core general terminology for the electronic health record (EHR) and contains more than 311,000 active concepts with unique meanings and formal logic-based definitions organized into hierarchies. When implemented in software applications, SNOMED CT can be used to represent clinically relevant information consistently, reliably and comprehensively as an integral part of producing electronic health records."[1]

An example of recent movement toward the use of SNOMED CT in EHRs is illustrated under the Centers for Medicare and Medicaid Services' "meaningful use" EHR Incentive Program's stage 1 core measures for problem lists. To meet the measures of this objective, eligible providers are required to use ICD-9-CM or SNOMED CT for entries into the EHR that record an up-to-date problem list of current and active diagnoses. The Office of the National Coordinator for Health IT (ONC) has adopted ICD-9-CM or SNOMED CT for the entry of this measure's structured data and has made the ability to perform the measure a requirement for program-certified EHR technology.

As the meaningful use measures continue to evolve, the use of SNOMED CT will increase in additional meaningful use objectives and measures-such as obtaining clinical quality measures (CQMs) electronically in an EHR and using SNOMED CT only for optimal clinical data capture and reuse of information captured in problem lists.

History of SNOMED CT

SNOMED CT was originally created and maintained by the College of American Pathologists (CAP) by combining SNOMED RT and Clinical Terms Version 3. Although CAP continues to be actively involved in supporting and developing SNOMED CT product solutions, in 2007 SNOMED CT intellectual property rights were transferred to the SNOMED Standards Development Organisation in the formal creation of IHTSDO.

The transfer of ownership to IHTSDO was meant to promote international adoption and use of SNOMED CT. IHTSDO is responsible for ongoing maintenance, development, quality assurance, and distribution of SNOMED CT. The US is a participating member in IHTSDO through the National Library of Medicine.

The National Library of Medicine is the central coordinating body for clinical terminology standards within the US Department of Health and Human Services (HHS). It works closely with ONC to ensure that efforts are aligned with the goal of the federal government for the nationwide implementation of an interoperable health information technology infrastructure that improves the quality and efficiency of healthcare. The National Library of Medicine distributes SNOMED CT free of charge to US and international users under the terms of the standard IHTSDO affiliate license, which is included in the Unified Medical Language System license agreement. Revisions to the international version of SNOMED CT are released twice a year.

SNOMED CT consists of a multilingual controlled clinical reference terminology with comprehensive coverage of diseases, clinical findings, etiologies, procedures, living organisms, and outcomes used for recording clinical data. SNOMED CT consists

of more than 300,000 active concepts, nearly 1 million descriptions, including synonyms, that can be used to refer to a concept, and over 1 million links or semantic relationships between the SNOMED CT concepts.

SNOMED CT concepts are organized into top-level hierarchies. Each of these hierarchies subdivides into smaller sub-hierarchies. Concepts are related by "is a" relationships to their more general parent concepts directly above them in the hierarchy. The sidebar on page 75 lists the top-level hierarchies. The sidebar above provides an overview of the IHTSDO basic SNOMED CT components.

SNOMED CT Working Behind the Scenes in an EHR

In the following excerpt from an electronic health record, a few of the applicable SNOMED CT codes are noted in parentheses to illustrate what SNOMED CT is doing behind the scenes. Unlike the ICD-9-CM coding classification system where a coding professional assigns diagnostic and procedural codes, SNOMED CT codes are embedded in the EHR system. In the following excerpt from an electronic health record, a few of the applicable SNOMED CT codes are noted in parentheses to illustrate what SNOMED CT is doing behind the scenes. Within the EHR, SNOMED CT automatically identifies standard terms and then tags them for future reference.

This 85-year- *(258707000)* old *(70753007)* female *(248152002)* was admitted via the emergency room *(50849002 ED admission)* from the nursing home *(42665001)* with shortness of breath *(267036007)*, confusion *(225440008 onset of confusion)*, and congestion *(85804007)*. There was no history of *(14792006)* fever *(386661006)* or cough *(49727002)* noted. Patient also has a history of *(392521001)* senile dementia *(15662003)* and COPD *(13645005)*…

Prior to admission, the patient was on the following medications:

Prednisone *(116602009)*, Lasix, Haldol *(349874003)*, and Colace. Patient also has been on lorazepam 0.5mg tablet *(377147002)* 2x a day as needed for anxiety *(48694002)*. Patient is noted to have vitamin C deficiency *(76169001)*…

Source: Giannangelo, Kathy. *Healthcare Code Sets, Clinical Terminologies, and Classification Systems*, 2nd edition. Chicago, IL: AHIMA Press, 2010.

SNOMED CT Tools and Resources

New and experienced SNOMED CT users will find valuable tools and resources through CAP, the National Library of Medicine, and the Unified Medical Language System.

The following list includes examples of some key tools and resources that could be of interest to coding professionals.

- A complimentary Unified Medical Language System Terminology Services (UTS) account, available at www.nlm.nih.gov/databases/umls.html, will provide access to download SNOMED CT Release Files and related resources.
- US Extensions to SNOMED CT, available at www.nlm.nih.gov/research/umls/Snomed/us_extension.html, provides a process for the US to address programmatic or clinical needs in a manner consistent with the review criteria of the IHTSDO.
- SNOMED CT subsets are available for use with a particular language, dialect, country, specialty, organization, user, or context in the CORE Problem List Subset of SNOMED CT. This subset facilitates the use of SNOMED CT for coding problem list data in EHRs. Presently, the subset includes approximately 5,000 SNOMED CT concepts. Available at http://www.nlm.nih.gov/news/snomed_core_200907.html.
- Cross mappings enable SNOMED CT to effectively reference other terminologies and classifications. The ICD-9-CM to SNOMED CT Cross Map is available for the translation of legacy data and use of SNOMED CT for patient problem lists. Available at http://www.nlm.nih.gov/research/umls/mapping_projects/icd9cm_to_snomedct.html.

- The SNOMED CT to ICD-10-CM Cross Map supports the semi-automated generation of ICD-10-CM codes from clinical data encoded in SNOMED CT. Available at http://www.nlm.nih.gov/news/snomed_icd10cm_map_preview.html.
- SNOMED CT Browsers provide users with the capability to search for and display SNOMED CT content. Available at www.nlm.nih.gov/research/umls/Snomed/snomed_browsers.html.
- Documentation Guides such as the "User Guide" describes SNOMED CT content, structure, and terminology. The User Guide provides an overview of the classification system and illustrates SNOMED CT's capabilities from a content perspective. Available at http://ihtsdo.org/fileadmin/user_upload/doc/.
- The SNOMED CT Glossary is included in the User Guide and is helpful when referencing the guide as well as other SNOMED CT documentation. The glossary includes a list of common terms, like "fully defined concept" and "hierarchy," found in the User Guide and offers definitions. Available at http://www.cap.org/apps/docs/snomed/documents/snomed_ct_glossary.pdf.

Overview of the IHTSDO Basic SNOMED CT Components

Concepts

- SNOMED CT concepts represent clinical ideas, ranging from abscess to zygote
- Every concept has a unique numeric code known as the "concept identifier"
- Concepts are organized in hierarchies, from the general to the specific; this allows detailed clinical data to be recorded and later accessed or aggregated at a more general level

Descriptions

SNOMED CT descriptions link appropriate human-readable terms to concepts. A concept can have several associated descriptions, each representing a synonym that describes the same clinical idea.

There are nearly 1 million English descriptions in the international release of SNOMED CT. Each translation of SNOMED CT includes an additional set of descriptions that link terms in one language to the exact same SNOMED CT concepts in another language.

Relationships

SNOMED CT relationships link each concept to other concepts that have a related meaning. These relationships provide formal definitions and other characteristics of the concept.

One type of link is the "is a" relationship, which relates a concept to its more general concepts. For example, the concept "viral pneumonia" has an "is a" relationship to the more general concept "pneumonia." These "is a" relationships define the hierarchy of SNOMED CT concepts.

Other types of relationships represent other aspects of the definition of a concept. For example, the concept "viral pneumonia" has a "causative agent" relationship to the concept "virus" and a "finding site" relationship to the concept "lung."

Source: IHTSDO. "SNOMED CT Components." Available at http://www.ihtsdo.org/snomed-ct/snomed-ct0/snomed-ct-components/.

Summary of Top-Level Hierarchies

- Clinical finding
- Procedure

- Observable entity
- Body structure
- Organism
- Substance
- Pharmaceutical/biologic product
- Specimen
- Special concept
- Linkage concept
- Physical force
- Event
- Environment or geographical location
- Social context
- Situation with explicit context
- Staging and scales
- Physical object
- Qualifier value
- Record artifact

Note

1. IHTSDO. “About SNOMED CT.” www.ihtsdo.org/snomed-ct/snomed-ct0/.

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