SNOMED CT and the EHR: Why Should a HIM Professional Care?

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Health information management (HIM) professionals serve as the data stewards of the patient medical record. They are responsible for capturing all necessary information about a patient and managing that information over time. As such, it is vital that these professionals understand how clinical data is captured and stored in the age of electronic health records (EHRs).

In tandem with widespread adoption of EHRs, the healthcare industry has become very good at capturing, storing, and utilizing highly structured and codified claims data. Providers, payers, and other stakeholders exchange data regularly using common coding and billing standards for use in revenue cycle management. Secondarily, this data is used in population health, care management, and administrative analytics. Unfortunately, structured claims data only tells a portion of the total patient story. Much of the narrative is locked inside the EHR in unstructured and semi-structured format, making it impossible to share critical pieces of information—often when it matters most.

By now, most healthcare organizations recognize some of the challenges associated with aggregating and sharing clinical information in a machine-readable format. It's why so many government and private initiatives are underway to create interoperable frameworks that support meaningful sharing of health information. Adoption and use of standard terminologies within health IT systems is fundamental to these movements.

As a widely-used industry clinical terminology standard, the Systematized Nomenclature of Medicine – Clinical Terms (SNOMED CT®) serves as one part of the solution. SNOMED CT is the most comprehensive, multilingual clinical terminology in the world, encompassing more than 340,000 concepts.[1] Each concept carries a unique identifier (code) as well as multiple terms, synonyms, and definitional relationships to other SNOMED CT concepts. SNOMED CT not only captures the rich clinical information that is important to clinicians in language that they speak, but it is designed specifically for capturing, exchanging, and analyzing clinical data in a way that is relevant to clinical practice.

In the United States, the importance of SNOMED CT was underscored when stage 2 of the "meaningful use" EHR Incentive Program required it for capturing problems, procedures, and smoking status.[2] That requirement remains in place even as the meaningful use program undergoes important modifications. Going forward, it is a critical component of any strategy designed to support recording and transmission of rich clinical information to improve patient care.

SNOMED CT: A Deeper Look

Developed by the College of American Pathologists in 1975, the current structure of SNOMED CT was released in 2002. The clinical vocabulary is now owned and maintained by SNOMED International (formerly the International Health Terminology Standards Development Organization). SNOMED International has 29 member countries, and the standard is used in more than 50 countries.[3]

SNOMED CT is superior to ICD-10 for clinical representations due to its controlled focus on clinical concepts and multi-axial structure. While ICD-10 is designed as a hierarchical statistical classification system, SNOMED CT is represented by multiple levels of granularity. Some of these levels include:

- Body Structure
- Clinical Finding
- Event
- Procedure
- Social Context

- Substance

The SNOMED vocabulary encompasses more than 340,000 concepts, 794,000 descriptions, 19 hierarchies, and 920,000 relationships, drilling deep into diseases and their interrelationships. The scope of SNOMED CT covers topical areas such as problems, diagnosis, organisms, pharmaceutical descriptions, and anatomic areas, enabling clinicians to capture, store, display, and query clinical detail in EHRs. In contrast, ICD-10 serves a different purpose as a disease classification system for reporting and billing. The scope of ICD-10 focuses primarily on diseases, injuries, signs, symptoms, complaints, procedures, and social circumstances.

SNOMED CT in Action

Today, SNOMED CT is essential for recording and sharing clinical data across IT systems and organizations. Beyond the requirements of meaningful use, SNOMED CT can be used to capture family history, allergies, and past medical history. It can be mapped to other international standards, such as ICD-9 and ICD-10, to better facilitate semantic interoperability—or the meaningful sharing of patient information electronically.

While SNOMED International has led the industry in terms of clinical data capture, the organization has historically lacked robust laboratory content. A partnership with the Regenstrief Institute signed in 2013 is designed to develop coded content to support order entry and result reporting, among other areas of shared interest.[4] As of 2015, there were 14,736 LOINC terms linked to SNOMED CT and 4,061 LOINC parts to SNOMED CT concepts.[5] By aligning representations of laboratory test attributes and some clinical measurements, this partnership promises to equip users with a common framework for using LOINC and SNOMED CT.

As previously noted, SNOMED CT's strengths are found in the capture of the clinical detail necessary to fully describe medical conditions and their complex interrelationships with each other. The multiple hierarchies add clinical detail that are not found in any other terminology in use today, and the distinct elements make it easier for clinicians and organizations to aggregate patients and answer important questions as part of analytics initiatives.

For example, the idea of "influenza" could mean the disease influenza or the virus that causes the disease. The implementation of SNOMED CT in the EHR ensures that a clinician is only allowed to choose the concept for influenza that "is a" respiratory tract infection and "has a" causative agent of influenza virus (virus). Each of these distinct elements and the relationships between them is captured by the single concept of influenza (disorder) on the problem list and then made available for querying. This granular detail can then be used by a population health department or a health information exchange (HIE) to identify patients with a relationship of "is a" respiratory tract infection separately from the list of patients with the disorder influenza.

When clinical terms are mapped between ICD-9, ICD-10, and SNOMED CT, healthcare organizations can seamlessly achieve greater revenue cycle efficiencies and accuracies by eliminating productivity losses associated with trying to identify the correct code from ICD-10's expansive 155,000 options.

Consider the complexities of the following example:

A digital myxoid cyst (sometimes called a mucous cyst) refers to a benign swelling that occurs on the fingers or, sometimes, the toes. For the most part, in ICD-10, this condition is coded under M71.349—Other bursal cyst, unspecified hand. In SNOMED CT, it falls under 404098005—Digital mucous cyst.

Providers typically search for this condition by referencing it as a "myxoid cyst," yet ICD-10 does not recognize that terminology. In ICD-10, a digital myxoid cyst is categorized the following way:

- **Parent:** M71.34, Other Bursal Cyst, Hand
- **Siblings:** M71.341, Other Bursal Cyst, Right, M71.342, Other Bursal Cyst, Left Hand
- **Diagnostic Category:** 08
- **Chronic Condition Indicator:** No
- **Billable:** Yes

In contrast, the SNOMED CT classification of myxoid cyst will appear as follows:

- **Has Parents:** 248519003 Lump on Extremities (Finding); 128597007 Disorder of Digit (Disorder); 445008009 Ganglion Cyst (Disorder)
- **Has an Associated Morphology:** 71307009 Ganglion Cyst (Morphologic Abnormality)
- **Has a Finding Site:** Digit Structure (Body Structure)
- **Is A:** 445008009 Ganglion Cyst (Disorder)
- **Is A:** 248519003 Lump on Extremities (Finding)
- **Is A:** 128597007 Disorder of Digit (Disorder)
- **Synonyms:** Digital Myxoid Cyst, Digital Synovial Cyst, Digital Mucous Cyst

The advantage of SNOMED CT in this case is that clinicians can query using common language (Digital myxoid cyst). Once a clinician has selected the SNOMED concept of digital mucous cyst, the EHR should prompt them to select the correct billing code from the ICD-10 hierarchy that describes all options for other bursal cyst, hand. This ICD-10 term is then added to the diagnosis list and sent to HIM for verification. Without SNOMED CT and associated maps to ICD-10-CM, the clinician would need to search for the ICD-10 term "bursal cyst"—a term that does not adequately describe most patients' conditions and is not language that is natural to a clinician.

While the good news is that SNOMED CT is now widely used, the industry at large recognizes that adoption of the standard must continue. In its recent report, "Optimizing Strategies for Clinical Decision Support, Summary of Meeting Series," the National Academy of Medicine makes several recommendations for a national strategy on standardizing clinical decision support systems.[6] One of the challenges noted in this report is data quality and use of standards in clinical data. SNOMED CT is the recognized standard for recording this data in a codified manner. Going forward, HIM professionals will play a critical role in the continued adoption and advancement of this very important clinical vocabulary.

More information on SNOMED CT can be found at the following links:

- US National Library of Medicine: www.nlm.nih.gov/healthit/snomedct/index.html
- SNOMED International—General information as well as a link to the E-learning Center: www.snomed.org/snomed-ct; take the SNOMED CT Foundation Course before undertaking the more advanced courses: www.snomed.org/snomed-ct/learn-more/snomed-ct-elearning-courses

Notes

1. SNOMED International. "SNOMED CT: The Global Language of Healthcare." www.snomed.org/snomed-ct.
2. Ibid.
3. SNOMED International. "What is SNOMED CT?" www.snomed.org/snomed-ct/what-is-snomed-ct.
4. Indiana University School of Medicine. "New Regenstrief and IHTSDO agreement to make EMRs more effective at improving health care." Press release. January, 24 2013. http://news.medicine.iu.edu/releases/2013/07/ihtsdo-loinc.shtml.
5. SNOMED International. "LOINC." www.snomed.org/snomed-ct/mapping-to-other-terminologies/loinc.
6. National Academy of Medicine. "Optimizing Strategies for Clinical Decision Support: Summary of a Meeting Series." 2017. https://nam.edu/wp-content/uploads/2017/11/Optimizing-Strategies-for-Clinical-Decision-Support.pdf.

Link
New Informatics Blog on *Journal* Website

http://journal.ahima.org/category/blogs

Illuminating Informatics is the *Journal of AHIMA*'s newest blog. Check it out on the *Journal* website to further explore the topic of health informatics—a collaborative activity connecting people, processes, and technologies to produce trusted data for better decision-making. Those interested in learning more about writing a guest blog post can contact AHIMA's Dawn Paulson at dawn.paulson@ahima.org.

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