

AHIMA Project Offers Insights into SNOMED, ICD-9-CM Mapping Process

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AHIMA's Clinical Vocabulary and Terminology Expedition

In 1999, AHIMA appointed the Coding Futures Task Force to study the likely futures in the domain of coding practice. The group's conclusions, summarized in the January 2000 (vol. 71, no. 1) *Journal of AHIMA* article "A Crystal Ball for Coding," indicated HIM professionals must be educationally prepared to go well beyond assignment of diagnostic and procedural codes and into broader areas of formalization that enable a leading position in the development of algorithmic translation, concept representation, and mapping among clinical nomenclatures and reimbursement methods.¹

Today, AHIMA's Clinical Vocabulary and Terminology Expedition exists to further the work of the task force. The goal of this group is to position AHIMA as a leader in the creation, maintenance, and oversight of the vocabulary mapping process. It also works to position HIM as the profession that embodies clinical vocabulary and terminology experts. One of the group's objectives is to form alliances with clinical vocabulary and terminology developers and users. The partnership with SNOMED is one example.

How can clinical data specialists working with a coding classification system and a terminology ensure accuracy and maximize efficiency? They rely on "maps" or "crosswalks." Ideally, these systems are easy to use and understand.

Many coders are already comfortable using maps (see "[Maps, Crosswalks: Don't Leave Home Without Them](#)," below). But the industry still has a lot to learn about the mapping process. To advance understanding of the mapping process between the Systematized Nomenclature of Medicine (SNOMED®) terminology and International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM), AHIMA and the creators of SNOMED joined forces in 2001. The project's goal was to assess the effectiveness and reliability of the existing mapping process and to advance the industry's understanding of any limitations the map might have for administrative uses.

Maps, Crosswalks: Don't Leave Home Without Them

Maps between terminologies or classification schemes are created and used for various reasons.

ICD-9-CM Updates

Every year, when the new ICD-9-CM codes are released, a crosswalk, or map, is created between the old codes and the new ones. This map, created by the government agencies that oversee the ICD-9-CM coding system, is easy to create because the basis is a single system. It is also easy to implement and simple to use. Coders understand how to use it and why they should use it.

The yearly ICD-9-CM map also serves as a historical resource that allows facilities and researchers to perform longitudinal studies of diseases and procedures for purposes such as improved patient outcomes and epidemiological studies.

ICD-9-CM to CPT (and vice versa)

Other maps, such as the map from ICD-9-CM procedure codes to CPT, exist due to billing requirements by third-party payers.

For instance, coders are also familiar with the map from ICD-9-CM procedure codes to CPT codes (or vice versa). The coding community is also familiar with this map's problems. Because ICD-9-CM is a classification system and CPT is a terminology, there is not always a one-to-one relationship between the two.

By definition, a classification groups together similar concepts and a terminology represents the system of concepts of a particular subject field. To develop a map, an understanding of two divergent systems is required.

Most of the time, this crosswalk is incorporated into an encoder software product and automated. Once a code is assigned in ICD-9-CM or CPT, a simple click on a menu bar provides the other system's code or codes.

Of course, there are always caveats. For instance, the vendor's map or translation between systems must be accurate. And end users must understand the mapping process to prevent incorrect assumptions that may affect data consistency. For example, the software may provide a range of codes or more than one code and the coder will have to determine which is correct.

The good news is the need for this map will vanish on October 16, 2003, when the HIPAA standard medical code sets go into effect. On that date, the ICD-9-CM Volume III procedure codes will only be used to describe a procedure performed on a hospital inpatient. CPT will continue to be used, as will ICD-9-CM Volume III, but "dual coding"—coding hospital outpatient procedures using both ICD-9-CM and CPT—will no longer be necessary. Data on hospital outpatient procedures will be maintained in CPT only; therefore, any comparability studies will need to take this into account.

DSM-IV to ICD-9-CM

Coding professionals at facilities that treat mental health disorders are also familiar with the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) to ICD-9-CM crosswalk. Like the ICD-9-CM to CPT map, this map became necessary due to the requirement of a third-party payer. The federal government required ICD-9-CM codes, not DSM, for claim submission for Medicare beneficiaries. However, behavioral health practitioners consider DSM their nomenclature. And the diagnostic categories, criteria, and textual descriptions are meant to be employed by individuals with appropriate clinical training and experience in diagnosis.²

AHIMA worked with the American Psychiatric Association in the creation of a crosswalk. The development involved auditing each diagnostic term using the Alphabetic Index (for inclusion) and then the Tabular List of ICD-9-CM (to assess appropriateness of classification).³ This map is an example of taking clinical concepts defined in the vocabulary and translating them into a code from a classification. Like other maps, it has complexities and drawbacks, such as the need for expertise in two distinct systems. An additional intricacy for mapping in this instance was the need to work closely with the owner of the terminology to ensure an accurate map.

Coding professionals may be less familiar with additional maps such as:

- SNOMED Clinical Terms (SNOMED CT) to Nursing Terminologies
- SNOMED CT to Logical Observation Identifiers Names and Codes (LOINC)
- SNOMED CT to the International Classification of Diseases for Oncology (ICD-O)

As a result of this work, AHIMA has gained new insights about the granularity of a clinical terminology and the subjectivity of code assignment to a classification. This article will reveal the results of the project and provide context on its process and methodology.

How Is Mapping Different from Coding?

At its simplest, mapping is linking content from one terminology or classification scheme to another. It requires deciding how they match or in some instances, are similar or don't match at all. Mapping considers different purposes, levels of detail, and

coding guidelines of source and target. The mapping process employs a standard method in which the terminology context or classification description principles are interpreted between systems.

Coding is designating descriptions of diseases, injuries, and procedures into numeric or alphanumeric designations. It involves the use of a health record as the source for determining code assignment.

Automated maps create efficiency by minimizing duplicative data entry and patient data integration across a wide variety of applications. A crosswalk creates a map from one code system to another, usually involving an automated translation software engine.

Today's SNOMED mapping contains more than 95,000 terms for the disorders and findings hierarchies, while the ICD-9-CM disease classification has fewer than 10,000 codes. To map from one to the other requires a defined procedure and corresponding rules recognizing each system's unique characteristics and purpose. The key objectives of the AHIMA project were to develop a set of mapping rules based on the ICD-9-CM classification and to suggest enhancements or refinements to the current mapping guidelines and methodology used by the SNOMED team, thereby helping to define realistic user expectations.

Why Maps Matter

One of AHIMA's goals is to help prepare its members and the industry for the challenges and opportunities of a changing healthcare workplace. Coding, as one of the domains of HIM, faces great potential for rapid change. The electronic health record with embedded terminology is becoming a reality, and the development of automated coding technology greatly affects traditional coding practice.

AHIMA supports and works toward advancements that will improve productivity and enhance the accuracy of coded data. One important advancement is the adoption of standardized clinical terminology with automated mapping and coding tools. This adoption is integral to the development of a national health information infrastructure.

However, having a map does not necessarily eliminate coding or the need for expertise in code selection. Maps standardize linkages to a certain extent and therefore improve coding accuracy simply and efficiently through automated algorithms.

Putting a system in place that fully automates the process of mapping from a clinical terminology to an administrative code set is challenging because of the inherent differences between a clinical terminology and classifications. In the AHIMA mapping project, participants gained a greater understanding of the granularity of a clinical terminology and the subjectivity of code assignment to a classification, and the incompatibility issues that can occur in code assignment.

The Mapping Project: A Key Partnership

SNOMED is developed and maintained by the College of American Pathologists (CAP). SNOMED CT (clinical terminology) is a comprehensive, multilingual clinical terminology tool providing the information framework for clinical decision making for electronic medical records.

SNOMED International, a division of the CAP, developed a map from the SNOMED CT standardized clinical terminology to ICD-9-CM classification system. Users of SNOMED depend on a reliable mapping tool to facilitate administrative coding. According to SNOMED International, the mapping structure provides a technical structure that will eventually support rule-based processing and thus facilitate automated cross mapping.⁴

When AHIMA and SNOMED joined forces to review the SNOMED to ICD-9-CM map, the two parties agreed on a random sampling plan. The SNOMED terms selected consisted of a 5 percent sample of the then-current SNOMED RT (SNOMED Reference Terminology) Version 1.5 mapping, which consisted of terms from the Disease and General Patient Findings hierarchies. (The most current version of SNOMED is SNOMED CT, which was first released in 2002 and is a combination of the content and structure of SNOMED RT and the United Kingdom National Health Service's Clinical Terms Version 3, formerly known as the Read Codes.)

At the same time, a committee of AHIMA staff members (including coding practice managers and others) developed a methodology, resources, and goals, as well as a project design and outline. Official coding resources, such as the US

Department of Health and Human Services CD-ROM, were used along with common coding references. The team also used a tool used by the SNOMED team, the CLUE browser.⁵ Two encoders were selected based on their widespread use in the industry, their encoder structure, and availability to the AHIMA staff.

The project used previously identified mapping rules based on official ICD-9-CM conventions.⁶ In addition, participants created a set of data elements and created data collection steps for placement in a database. AHIMA's coding practice staff mapped the 5 percent sample to the ICD-9-CM codes and compared their mapping result to the SNOMED mapped result. To ensure inter-rater reliability, two independent AHIMA staff members mapped each term, and the group analyzed and resolved all discrepancies. The final AHIMA-mapped codes and category assignment were compared to SNOMED mapped codes and category assignments, and variances again were identified and analyzed.

Knowledge Gained

The summary of results indicated that AHIMA staff selected the same mapping as the SNOMED team 87 percent of the time. In addition, the AHIMA raters produced the same mapping between themselves 85 to 86 percent of the time.

Project participation also brought the group to several new insights about the mapping process:

- The process depended on several factors. Applying the rules that govern the use of a particular ICD-9-CM code, AHIMA coding staff members found, could be a straightforward or complex process, depending on two things: the SNOMED concept that was being mapped and the coder's understanding of the context of the term and knowledge of the system to which it was being mapped. They also discovered that the two systems are very different in structure and that in many cases it was not possible to obtain a perfect "match" in a numeric or alphanumeric code in ICD-9-CM for clinical concepts defined in SNOMED.
- Resources and guidelines were key. The outcome of the map was also influenced by how the mapping rules were defined and applied and the available resources. In addition, the participants learned the importance of using defined mapping rules and applying them consistently. The availability of specific examples and guidelines for the mapping rules, for example, ensures that all participants can interpret the definitions in the same manner.
- Coder knowledge was a factor. In addition to available resources, the success of a mapping project also depends on the knowledge of the person doing the mapping. Individual knowledge and interpretation of the ICD-9-CM axis of classification for and understanding of the SNOMED clinical term affected code assignment. Even when coding resources are available, the coder must figure out the relationship between the meaning of the condition being coded and the rules of the classification to select the correct code. Even individuals with sound knowledge of medical concepts and of ICD-9-CM may not map the SNOMED concept to the same ICD-9-CM code. These disagreements will frequently occur due to the nature of mapping a terminology to a classification.
- Differences in structure add to difficulties. Data analysis showed when the SNOMED concept was specific. Because ICD-9-CM is a classification system, a separate code may not be available for each concept that SNOMED identifies. This is because the SNOMED terminology is more granular, with more specificity than the ICD-9-CM classification. By definition, a classification is a systematic arrangement of similar entities on the basis of differing characteristics. ICD-9-CM employs multiple axes of classification. Within individual chapters, different axes are used in classifying different diseases. Therefore, ICD-9-CM lists synonyms or conditions similar enough to be classified in the same code. Some SNOMED concepts resulted in no ICD-9-CM code assignment, because SNOMED content extends beyond disease concepts while ICD classifies diseases only.

The important insights about the variability of the mapping process lead us to several conclusions about mapping. Understanding the importance of resources, for example, suggests that development of rules will help to minimize incompatibilities in the mapping process without compromising clinical integrity.

The project also reinforces the importance of the role of the coder. Even as coding processes become more automated, the project shows that coding professionals will be needed to review one-to-many or many-to-one relationships in order to develop these rules for algorithmic translation.

AHIMA has taken the first step toward expanding its involvement in clinical terminology projects to learn their structure and uses firsthand, how they will link to coding, and future roles for HIM professionals working with terminologies.⁷ We'll continue to explore new opportunities and keep you informed.

Know Your Terms: A Mapping Glossary

- Classification system: A system that groups together similar diseases and procedures and organizes related entities for easy retrieval
- Clinical coding: The designation of descriptions of diseases, injuries, and procedures into numeric or alphanumeric designations. Involves the use of a health record as the source for determining code assignment
- Crosswalk: The creation of a map from one code system to another, usually involving an automated translation software engine
- International Classification of Diseases for Oncology third edition (ICD-O-3): A dual-axis classification intended for use in cancer registries, pathology departments, and other agencies specializing in cancer research
- Logical Observation Identifiers Names and Codes (LOINC): A database of a standard set of universal terms and codes for identifying individual laboratory and clinical results that allows users to merge clinical results from many sources into one database for patient care, clinical research, or management
- Mapping: The process of linking content from one terminology or classification scheme to another
- Nomenclature: In medicine, a recognized system that lists preferred medical terminology
- Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT): A comprehensive, multilingual clinical terminology containing descriptions or synonyms relating to clinical concepts linked to clinical knowledge to enable clinical decision making for electronic medical records
- Terminology: A set of terms representing the system of concepts of a particular subject field. Thus, a terminology used in healthcare would contain a set of terms that describe health concepts
- Vocabulary: The set of words used by an individual or group within a particular subject field

Notes

1. Johns, Merida. "A Crystal Ball for Coding." *Journal of AHIMA* 71, no. 1 (2000): 26-33.
2. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision. Washington, DC: American Psychiatric Association, 2000.
3. Albaum-Feinstein, Andrea. *DSM-IV Crosswalk Guidelines for Coding Mental Health Information*. Chicago: AHIMA, 1999.
4. Imel, Margo. "A Closer Look: The SNOMED Clinical Terms to ICD-9-CM Mapping." *Journal of AHIMA* 73, no. 6: 66-69.
5. CLUE software is provided by the Clinical Information Consultancy. For more information, go to www.clinical-info.co.uk.
6. Brouch, Kathy. "The Road to Automated Mapping." *Journal of AHIMA* 72, no. 7 (2002): 60-61.
7. Johns.

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