Too Many Coding Systems, Too Much to Do: Different Clinical Classification and Clinical Terminology Systems Uniquely Impact IT, Quality Management

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By Deborah Kohn, MPH, RHIA, FACHE, CPHIMS, CHTS-CP

The notion of managing and being accountable for the health status of defined populations requires much more sophisticated clinical data collection methods and skills than most healthcare organizations have today. Numerous "coding systems" have been used for decades to successfully capture clinical data for reporting purposes such as quality initiatives and outcome measurements, as well as for reimbursement and myriad other purposes.

Health information professionals categorize these coding systems as clinical classification systems or clinical terminology (i.e., nomenclature or vocabulary) systems. Clinical classification and clinical terminology systems have coexisted for decades. Both use clinical language, but they come from different domains and they are designed for distinctly different purposes.

Consequently, using the coding systems to meet any of the current, fast-growing clinical data collection and analysis initiatives presents a significant challenge—too many coding systems from which to choose. This proliferation hinders any effort to change the collection of the data into actionable information for interoperability and health information exchange. For example, too many coding systems often cause healthcare stakeholders to interpret exchanged information in different ways. Also, typically, existing information systems have limited abilities to electronically process exchanged information once the information is received. Existing information system implementation guidance is often limited for exchanged information or does not contain enough specificity to process the information.

Too Many Coding Systems

Clinical classification systems, such as ICD-9-CM, ICD-10-CM, and ICD-10-PCS, derive from epidemiology and health information management (HIM). They group similar diseases and procedures based on predetermined categories for body systems, etiology, or life phases. As such, they organize related entities for easy retrieval. Clinical classification systems are not intended or designed for the primary documentation, or "input," of clinical care. Therefore, they are considered "output" systems.

Clinical terminology systems, such as SNOMED CT and RxNorm, derive from health informatics. They are expressed in "natural" language, and typically codify the clinical information captured in an electronic health record (EHR) during the course of patient care. This is because the number of items and level of detail in a health record cannot be effectively managed without computerization. Therefore, they are considered "input" systems.

Both systems can continue to be used to assist in determining prospective, pre-emptive care management on covered populations. However, neither system meets all use cases. For example, ICD-9-CM does not contain medications. ICD-10-CM does not address functional status. The Logical Observation Identifiers Names and Codes (LOINC) code system is used to encode laboratory data. SNOMED CT is used to encode clinical care data. RxNorm is used to encode medications. To resolve these challenges, healthcare organizations that need to capture accurate data for primary and secondary uses and to exchange the data must invest in complex and costly system interfaces.

Developing a Central Authority Platform

In lieu of interfaces between coding systems, healthcare organization IT departments should consider deploying a "central authority platform (CAP)" for classification and terminology systems, allowing any or all the coding systems to be used to capture and exchange clinical data. With a CAP, healthcare organizations don't need to be concerned about when to use

which data collection system for which purpose. Organizations instead capture the required clinical, financial, and administrative data once and use it many times. Also with a CAP, organizations are able to compare the data for data integrity purposes. More importantly, organizations are assured that electronic healthcare data input by different users is semantically interoperable—that the data are understood and used while the original meanings of the data are maintained.

The following is an example of data that are captured and become semantically interoperable using a CAP:

> For typical diabetic patients, Reference Lab #1 might denote glycohemoglobin *within* the chemistry panel. Physician Office Lab #2 might denote glycohemoglobin as an independent test, HgbA1c. And Hospital Lab #3 might use the embedded LOINC code, 4548-4. The CAP recognizes each of the three laboratory information system inputs representing the same value—glucose level. Subsequently, the healthcare organization's EHR or business intelligence system makes use of the common meaning and, for example, generates a trend analysis of the patient's glucose readings over time.

Developing a CAP is no small effort. The platform must be able to store all coded values, metadata, and all the content or terms. It also must be able to normalize and catalog all the content or terms and must be able track all changes in content identifiers, watch for differences in terms, cross-map the content, route the content while preserving the data and context, and regenerate the data and content as it was stored. Lastly, a CAP must be able to manage all the content updates and releases. Today both public and private healthcare domains have been successful, albeit moderately, in developing such a platform.

The Office of the National Coordinator for Health IT and the Centers for Medicare and Medicaid Services collaborated with the National Library of Medicine to provide the Value Set Authority Center (VSAC). The VSAC is set to become the public domain CAP for the official versions of the value sets that support the "meaningful use" EHR Incentive Program's 2014 Clinical Quality Measures (CQMs). However, currently VSAC does not go far enough to cover all use cases.

Central Authority Platform at Work

A Central Authority Platform (CAP) can be utilized by an organization to capture and exchange clinical data between data collection systems.
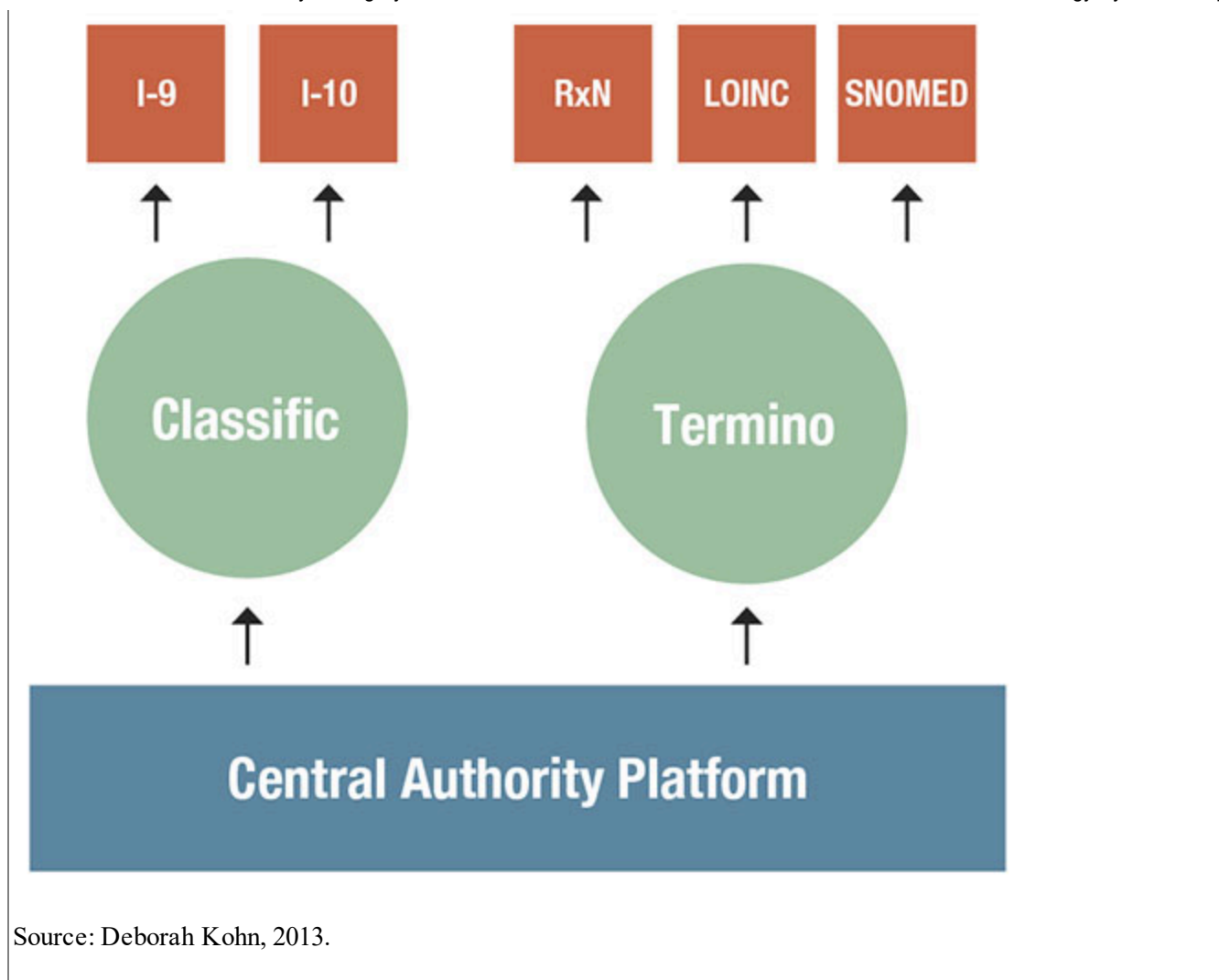
Source: Deborah Kohn, 2013.

Vendor Capabilities in the Private Domain

In the private domain, several health information technology (IT) vendors provide most of the required capabilities of the CAP. Interestingly, these vendors collaborated with clinical professionals to create different categories of coding systems to describe their products than those categories created decades ago by health information professionals. For example, the vendors typically refer to any coding system used for capturing and exchanging data as a "terminology" system, even though some of these systems are categorized by health information professionals as classification systems.

In addition, most vendors categorize all terminologies as either standard or local terminologies. According to these vendors, standard terminologies consist of "administrative" terminologies, such as ICD and CPT, and "reference" terminologies, such as SNOMED, LOINC, RxNorm, and UMLS. Local terminologies are those that healthcare providers, such as laboratories or physicians, use on a daily basis in their records or on the telephone to describe specific diagnoses and procedures.

Other vendors categorize all terminologies as either "retrospective" or "point-of-care terminologies." According to these vendors, retrospective terminologies consist of all standard terminologies (administrative and reference) and local terminologies, while point-of-care terminologies are those that are healthcare provider-friendly and used for specific documents. Consequently, not only are there too many coding systems for data capture and exchange from which to choose, but too many categories of coding systems to make sense of it all.

Assuming that both public and private domain CAP options prevail, healthcare organizations can expect widespread use of the platforms, allowing EHRs and other electronic records, such as patient financial records, to incorporate multiple coding systems for specified needs. This provides an opportunity for HIM professionals to be the people in a healthcare facility that can make sense of these various systems, and use that knowledge to improve healthcare and care processes.

Deborah Kohn (dkohn@daksystcons.com) is principal at Dak Systems Consulting, based in San Mateo, CA.

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