Problem List Coding in e-HIM

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by Greg Fraser, MD, MBI

In 1968 Larry Weed, MD, introduced the idea that a complete and accurate problem list is an essential component of the medical record.[1] The problem-oriented medical record (POMR), in which all data contained in the medical record can be linked to a list of problems, has been almost universally accepted ever since. POMRs help provide structure to the medical record and can guide clinicians through the process of problem solving during patient encounters.

Maintaining a problem list has become a standard of care in ambulatory medicine. In fact, the Joint Commission on Accreditation of Healthcare Organizations requires that an ambulatory summary list be "initiated for each patient by the third visit and maintained thereafter."[2] However, ensuring the problem list is complete, accurate, and up to date requires administrative effort on the part of clinicians.

EHRs: Simplifying Problem Lists

It is hoped that electronic health records (EHRs) will help ease some of the administrative burden and improve the overall quality of the problem list in the medical record. In its report on the computer-based patient record, the Institute of Medicine stated that "an easily reviewed and updated problem list" is an important part of an EHR.[3] This is particularly important when the medical record has evolved from a record of care maintained by and for a single provider into its present form where it must serve many providers as well as multiple administrative and medical-legal functions.

Ideally, EHRs should automatically generate a problem list based on historical and diagnostic data documented in the chart. The problem list should also be codified using a reference terminology, which requires structured data with codes embedded into every type of document in the EHR. Currently, very few EHRs actually do this, and those that do typically use ICD-9-CM codes.

The Problem with ICD-9-CM

Unfortunately, ICD-9-CM is poorly suited to serve this function. Clinicians have been dissatisfied with ICD-9-CM representation of problem list entries, as it lacks the granularity, specificity, and consistency necessary to accurately capture clinical meaning.[4] ICD-9-CM is a classification rather than a reference terminology and was not developed to be used in this way. A classification is a system that categorizes concepts into groups possessing similar characteristics, and the codes themselves have meaning. A classification is designed to be used primarily for administrative rather than clinical purposes. In the medical office, ICD-9-CM is most typically used to output clinical information for billing.

A reference terminology, on the other hand, is a set of precise terms that represent concepts belonging to a particular subject. Its purpose is to provide a full standard definition of concepts across locations and providers—in other words, a common language. The codes themselves do not carry any meaning. In the healthcare environment, there are multiple reference terminologies for different subject areas such as LOINC for laboratory data and RxNorm for pharmacy data.

What about SNOMED?

SNOMED Clinical Terms (SNOMED CT) is a clinical reference terminology. A clinical terminology is designed to capture the most detailed, complete, and accurate clinical data possible. Terminologies are generally much larger than classifications. Currently, SNOMED CT contains more than 364,000 concepts with unique definitions organized into 18 hierarchies. There are a total of 984,000 descriptions or synonyms and approximately 1.45 million semantic relationships. Meaning is conferred not only by the description of each concept but also by its place within the hierarchy and by defined relationships to other concepts. In comparison with clinically generated free-text problem statements, SNOMED CT has been found to cover up to 98.5 percent of entries. It would appear to be well suited to problem list coding.[5]

However, SNOMED CT cannot replace ICD-9-CM. Terminologies and classifications serve different functions, but both are necessary to meet the variety of healthcare data needs. Currently, most legacy information systems contain ICD-9-CM coded data, and providers are obliged to use ICD-9-CM for administrative and billing purposes. This is where mapping reference terminology to a broader classification is needed. Accurate maps allow the collection of clinical data once, which can then be used many times for multiple purposes. SNOMED International and others currently provide maps to ICD-9-CM.

SNOMED CT concepts most commonly map to ICD-9-CM in a many-to-one relationship. To give just one example, the distinct SNOMED CT concepts "atrial fibrillation," "nonrheumatic atrial fibrillation," "lone atrial fibrillation," "paroxysmal atrial fibrillation," "rapid atrial fibrillation," "controlled atrial fibrillation," and "atrial fibrillation and flutter," while clinically distinct from one another, can all be mapped to ICD-9-CM code 427.31.

SNOMED's Limitations

It would be incorrect to imply that SNOMED CT is without limitations. It is very large and highly granular. As it is continually updated and refined, with updates released about every three months, the systems and maps that use it must be updated and maintained. Some of the hierarchies consist of concepts that are not commonly used in clinical practice. It is impractical to give a clinician a list of 984,000 choices to describe each clinical encounter.

The size and heft of SNOMED CT can be addressed to some degree by creating a subset that can act as a problem list dictionary or by mapping to an existing interface terminology (such as Medcin) that can then function as searchable or selectable structured data for the clinician, thereby embedding coded terminology within the record. Functionally, autogeneration of coded problem list statements is crucial; otherwise, they are no easier to maintain and share than a paper problem list.

As EHR systems are adopted more and more in the healthcare environment, several things are required to achieve the potential for standardized, comparable patient data that can not only be shared between providers in order to improve the efficiency and quality of patient care, but also aggregated for other purposes such as chronic disease management and population health management:

- Standard reference terminologies must be embedded into EHR systems.
- Interface terminologies must be optimized for clinician use so that data entry moves away from unstructured free text.
- Comprehensive mapping to classification systems (e.g., ICD-9-CM or ICD-10-CM) must be maintained.

CCR: A Model for EHR Problem Lists

To illustrate the importance of a well-coded problem list, consider the example of the Continuity of Care Record (CCR) standard currently being developed by ASTM International and sponsored by the American Academy of Family Physicians, the American Academy of Pediatrics, the American Medical Association, and the Healthcare Information and Management Systems Society, among others. As proposed, the CCR is an XML document representing a snapshot summary of a patient's relevant healthcare data, both current and historical, collected from multiple parts of the EHR. Among other uses, it is designed to facilitate the transfer of patient care from one provider to another and to support the transfer of core patient data from one EHR to another as well as to and from hospital, laboratory, or radiology information systems.

Although there are many sections, including demographic data, insurance information, advance directives, medications, and alerts, one of the chief components of the CCR is the problem list. The value of the CCR is enhanced if the full clinical meaning of each problem is retained and expressed in as much detail as possible. The CCR standard allows for diagnostic data to be coded using both ICD-9-CM and SNOMED CT.

Terminologies and classifications serve different functions and both are required. However, a standard reference terminology provides a much stronger basis for capturing and codifying clinical problems in the POMR model. This will become increasingly important as EHR systems continue to disseminate and as standards for health information exchange and interoperability are adopted as we move toward achieving the vision of a national health information network.

Notes

1. Weed, Lawrence L. “Medical Records that Guide and Teach.” *New England Journal of Medicine* 278, no. 11 (1968): 593–600.
2. Joint Commission on Accreditation of Healthcare Organizations. *2003 JCAHO Hospital Accreditation Standards*. Oakbrook Terrace, IL: Joint Commission Resources, 2003.
3. Institute of Medicine, Committee on Improving the Patient Record, et al. *The Computer-Based Patient Record: An Essential Technology for Health Care*. Rev. ed. Washington, DC: National Academy Press, 1997, xx, 234.
4. Payne, T.H., G.R. Murphy, and A.A. Salazar. “How Well Does ICD9 Represent Phrases Used in the Medical Record Problem List?” *Proceedings of Annual Symposium for Computer Applications in Medical Care*, 1992: 654–57.
5. Wasserman, H., and J. Wang. “An Applied Evaluation of SNOMED CT as a Clinical Vocabulary for the Computerized Diagnosis and Problem List.” *Proceedings of the American Medical Informatics Association Symposium*, 2003: 699–703.

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