Making Standards Work for You: Content Vocabulary for Computer-based Patient Records

by Gretchen Murphy, MEd, RRA

Standards mark the progress of and contribute to strategies for achieving computer-based patient records (CPR) in the 1990s. The ASTM E1384 Standard Guide for Content and Structure of the Computer-based Patient Record illustrates this fact. Not only is this standard central to characterizing the clinical content of the patient care record, but it promotes consistent processes for designing the information systems that will serve as CPR components. This article provides updates on the l996 changes in the standard, directions on its application and use, and a look at the impact and value added to health informatics and the health information management profession.

Background

Organized in 1898, the American Society for Testing Materials (ASTM) has grown to one of the largest voluntary standards development systems in the world. ASTM publishes more than 9800 standards each year including standards for health informatics through Committee E31. These standards are sold throughout the world. Through ongoing support and the active participation of AHIMA volunteers and staff, significant progress has been made in leadership and collaboration with industry colleagues involved in standards activities. Today, key E31 health informatics subcommittees are chaired by AHIMA representatives, and their membership includes a number of HIM professionals. In fact, a focus on computer-based patient record developments is shared among several subcommittees within ASTM. Table 1 depicts the collaborative work in progress.

Table 1
How Selected ASTM Subcommittees Contribute to Healthcare Informatics

	Existing Standards	Work in Progress
Models Framework	E1715 Practice for an Object Model for Work here provides overall models to Registration/ Admission/Discharge/Transfer which the CPR conforms (RADT) Functions in CPR systems Subcommittee E31.19	Work here provides overall models to which the CPR conforms
Healthcare Terminology Infrastructure	Subcommittee E31.01 Subcommittee E31.21	Work here will provide guidance to terminology use in standards Work here focuses on networks
CPR Content Definition Evolving Repository	E1239 Guide for Description of RADT Systems Subcommittee E31.19	This standard defines initial identifying and demographic data related to CPRs

	E1384 Standard Guide for Content and Structure of the CPR Subcommittee E31.19 E1633 Coded Values for Data in Automated Primary Record of Care (CPR) systems Subcommittee E31.19 E1744 Standard Guide for a View of Emergency Medical Care in the Computerized Patient Record Subcommittee E31.12 Subcommittee E31.22	Work here will add to the minimum content view in E1384 by continually expanding possible vocabulary and aligning it with companion standards (HL7 and others) Work here builds ongoing master tables and pointers to code systems for CPR content data specified in E1384 This standard depicts a specified view for the CPR and builds on common vocabulary from E1384 Creating standards for medical transcription
Key Functions of CPR Systems: **Critical Attributes** Universal Features	E1762 Guide for Electronic Authentication of Health Care Information Subcommittee E31.20 Subcommittee E31.17	Developing both principles and technical functions Access, privacy, and confidentiality are in the balloting process
System Properties Functional Requirements	E1769 Guide to Properties of Electronic Health Records and Record Systems Subcommittee E31.12 E1714 Guide for Properties of Universal Health Identifier Subcommittee E31.12 E1239 Guide for Description of RADT Systems for Automated Primary Record of Care Systems Subcommittee E31.19	Developing new data views for CPRs and the Longitudinal Health Record for Diabetes
Linkage to Multiple Sites Message Standards	E1238 Specification for Transferring Clinical Observations Subcommittee E31.11	Work here has been blended with HL7 standards
Expert Advice Intelligence Layer	Subcommittee E31.15	Work here supports advice rules for CPRs and clinical event monitoring and applied interventions

ASTM 1384 Standard Guide for CPR Content and Structure -- What Does It Provide?

E1384 is a vocabulary content standard that has been in development since l985. Initially published in l991, this standard has undergone significant evolution to address both policy and design issues. The 1996 edition expands the definition of purposes and principles. An overall framework for building the CPR vocabulary is the central theme. Based on an organized list of working data elements contained in an annex with a recommended initial minimum content vocabulary, this edition clearly lays

out an evolving approach to content definition. Data representation through coded values and master tables links the vocabulary directly to established code systems and to other standards.[1]

Examining the standard's five purposes in more detail reveals its general scope. The first purpose is to identify the content and structure for computer-based patient records. As such, it carries all health-related information about a patient over time including all observations or descriptions of the patient and documentation of care and outcomes. The second purpose is to define the relationship of data coming from diverse systems. Clinical data will flow from contributing systems such as lab and pharmacy to the patient record repository. The third purpose is to specify the common vocabulary. In order to rely on consistency of clinical terms and their meaning, a common vocabulary will be required. This will permit CPRs to achieve universal value. The fourth purpose is to propose the concept and provide examples of data views according to unique care setting or clinical problem to accommodate natural diversity. Relating the logical structure of the CPR to current content of patient records is the fifth purpose. While it is quite true the CPR will not merely automate paper records, it is also true that the clinical information contained in today's paper record will be required along with new data in newly organized and more complete formats.

The principles indicate the basic intent of the standard. In brief, they state that the patient record is to be designated as the main patient-specific clinical repository-the primary source of clinical documentation; all records should contain a minimum essential content regardless of clinical site. This principle is built on the concept that an individual's basic health profile should be available to all healthcare providers in a predictable and reliable form. The principles also call for data elements for the CPR vocabulary to be defined and referenced according to standard nomenclatures and code systems and harmonized with formally approved standards. Data security and confidentiality measures are to be applied. Finally, a more active patient role in reporting data appropriate to support both CPR content development and outcomes assessment is specified.

How E1384 Determines CPR Content

E1384 defines basic information content groups for patient records. It organizes these content groups into segments such as demographics, provider data, financial data, diagnostic tests, medications, and so on. In this edition, the segments are now related to common objects such as patient, problem, encounter, and observations. Table 2 illustrates this approach.[2] Individual data elements are then listed according to a segment identification number, and the definition of the element is detailed in the annex portion of the standard. To use this standard:

1. Identify a foundation CPR vocabulary by adopting the minimum essential set of data proposed in the standard. See Table 2. Note that data that is "conditional" to a hospitalization or other limiting situation is noted as "c" directly on the minimum data set table in the standard.

2. Expand the minimum data content by choosing additional data elements required for your setting. As you identify additional data for your setting, draw them from the standard's annex dictionary. More than 830 specified data elements and their definitions are included. Propose vocabulary data element definitions using the standard definitions contained in the annex.

3. Use the tables that specify the choices that may be used to record the code value for each element. These are coded values or master tables. There may be as few as three choices or as many as the codes listed in ICD-9 or CPT coding systems.

   Many brief tables are drawn directly from HL7. Of course, many elements are currently text only-code values still to be determined.

4. Add additional data content required to meet the basic "data view" needs for the CPR content in your setting.

As users identify and recommend content additions that reflect unique data views required in their organizations, work continues. Suggestions are evaluated for updating the annex as an evolving repository for CPR content vocabulary. Users' recommendations fuel continuous revision of this standard.

Table 2
Patient Record Content Structure Data Categories,

Segments, and Object Relationships	
Data Category and Segments	**Entity**
Administrative Data	
I Demographics	Patient
II Legal Agreements	Patient
III Financial Information	Patient
IV Provider/Practitioner	Provider
Clinical Data: Problem/Diagnoses	
V Problem List	Problem
Clinical Data: History	
VI Immunization	Service Instance
VII Hazardous Stressor Exposure	Observation
VIII Health History	Observation
Clinical Data: Assessments/Exams	
IX Assessments	Observation
*Patient Reported Functional Status	Observation
Clinical Data: Treatment Plan	
X Clinical Orders	Orders
Clinical Data: Services	
XI Diagnostic Tests	Observations
XII Medications	Service Instance
XIII Scheduled Appts/Events	Encounter
Administrative Data: Encounters	
XIVa Administrative Data	Patient
*f Encounter disposition	Encounter
Clinical Data: Encounters	
b Chief Complaint/Diagnoses	Observations
c Clinical Course	Observation
*e Orders Orders	Orders
d Therapy/Procedures	Service Instance
*These are new concepts and/or reordered data. Note that the clinical heart of the CPR is the core of the entities (objects). The record segments that relate to these are shown.	

How ASTM E1633 Standard Specification for Coded Values for the CPR Works with E1384

E1633 is the companion standard that specifies the code sets for use with the data elements in E1384.[3] It covers the identification of lexicons. E1633's goal is to unify the representations for CPR data elements, data elements in other standard statistical data sets, and data elements in other healthcare data message exchange format standards. The coded values for each element may be designated as numerical, text, a brief set of choices as in the values allowed to record patient marital status, or more extensive master tables that are established code systems. SNOMED and CPT-4 are examples of code systems that may be the designated code values for a problem statement or a diagnosis data element.

How These Standards Relate to Message Standards in HL7

There are common elements in all of the standards work. In some cases, there is a direct match of health-related terminology and definitions. For example, key terms such as patient, universal identifier, provider, encounter, and others are defined in the same way. Also, in the latest version of E1384, certain coded value sets have been imported from ASTM 1238, which is equivalent to the Health Level Seven (HL7) message standard. Further, HL7 data item references are contained in E1384. It is important to note that this matching and alignment of terms has been initiated, but there is more to do.

The Impact of this Standard

Customers report they are using or planning to use E1384 in their CPR projects.[4] E1384 is the first standard for the computer-based patient record to focus on identifying content vocabulary. Current customers are using it as a reference standard in designing and building CPR data

A foundation CPR content across care sites is promoted in this guide. There are paper models for patient records in all care environments. Common clinical data can be traced from patient assessment, problem identification, plans, treatments, and results. In designating the multiple setting common data, this standard facilitates the development of consistent health and clinical profiles for all patients who receive health services. Furthermore, computer advancements offer far more complete information which, in turn, leads to better services and measurement of those services.

By meeting user needs for an initial CPR model including an initial CPR data model, it helps answer the question, "What data should be included in the CPR? Where shall we start?" For customers seeking ideas on how to define the content for their computer-based patient records, this standard provides a rich framework. Consultants report that this standard is a helpful resource to both large institutional CPR projects and to small private practice application developers.

It establishes links with other standards through common terms and conventions. Not only is vocabulary content required, but the means to access and transfer that content must be standardized to bridge the multiple systems and environments delivering the longitudinal health records. Thus, it is important that these linkages continue to be defined.

How to Promote This Standard -- Five Things You Can Do Now

1. Educate your organization's leaders about standards. As a natural resource for healthcare standards, today's health information managers continue to offer leadership to organizations as each enterprise works to develop flexible and strategic plans to accommodate its future.

2. Propose underlying principles for institutional CPR planning that will serve as a foundation for tactical change management. The principles featured in this standard endorse the transition from paper to electronic records by affirming the central role and goals of patient records and beginning the definition of the common vocabulary that adds value to the broader uses of health information.

3. Increase your participation in institutional efforts to build data dictionaries for applications and use in clinical repositories.5 Reference this standard in new data dictionary developments, and seek to align your organization's database definitions to those contained within the E1384 annex. Be confident that ongoing work continues to align these elements to other mainstream standards activities. ASTM provides review and feedback to all major national developments that affect standard content. The National Committee on Vital and Health Statistics' Core Health Data Elements is an example.6

4. Seek conformance to the standard in vendor contracts. Remarkable progress was achieved when healthcare organizations began to require HL7 provisions for application interfaces as a part of requests for proposals issued to health information system vendors. This continues to be a critical avenue to accelerating standards development.

5. Join us. Participate by sharing the work from your own organization and by making recommendations to ASTM Subcommittee E31.19 Vocabulary Content and Structure for Computer-based Patient Records.

Conclusion

Long before the Institute of Medicine's work at the beginning of this decade,[7] standards have charted an evolutionary path for health information managers. The Joint Commission on Accreditation of Healthcare Organizations and the National Committee on Quality Assurance are notable in their influence on the practice of managing patient data. Preparing and maintaining patient records to meet clinical uses and support research and analysis requirements of organizations relies on the application of these standards. AHIMA professional practice standards provide additional building blocks. Driven by the acceleration of healthcare information technology, standards development for health informatics has been a major focus of this decade. As we approach the year 2000, our goal remains evident.

"Useful, well-designed standards are essential for further development of clinical informatics. Without good standards, we cannot achieve interoperability nor can we implement longitudinal life-long electronic health files."[8] Our work continues.

Notes

1. ASTM. "ASTM E1384 Guide for Content and Structure of the Computer-based Patient Record." *1996 Annual Book of ASTM Standards,* Volume 14.01. West Conshohocken, PA: ASTM, 1996, p. 265.

2. Ibid., p. 271.

3. ASTM. "ASTM E1633 Specification for Coded Values Used in the Computer-based Patient Record." *1996 Annual Book of ASTM Standards,* Volume 14.01. West Conshohocken, PA: ASTM, 1996, p. 634.

4. Goverman, Irwin. "Orienting Health Care Information Systems Toward Quality." *Journal on Quality Improvement* 20, no. 11: 576.

5. Curtis, Clayton, and Susan Fenton. "Health Information Managers and Clinical Data Repositories: A Natural Fit." *Journal of AHIMA* 67, No. 4 (1996): 48.

6. For more information on the National Committee on Vital and Health Statistics Core Health Data Elements, see the January 1997 *Journal of AHIMA* article, "Toward Standardization of Health Information."

7. Dick, Richard, and Elaine Steen, eds. *The Computer-based Patient Record: An Essential Technology for Health Care.* Washington, DC: National Academy Press, 1991.

8. Blair, Jeff "What Are the Standards for Standards?" *Healthcare Informatics* 13, no. 10 (1996): 64.

Gretchen Murphy *is a project manager with Group Health Cooperative of Puget Sound, Seattle, WA, and a faculty member at the University of Washington School of Public Health and Community Medicine. She chairs the ASTM Subcommittee E31.19, Vocabulary for Computer-based Patient Record Content and Structure.*

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