HL7 Standard Shapes Content, Exchange of Patient Information

by Wayne R. Tracy and Michelle Dougherty, RHIA

NCVHS' endorsement of HL7 as the standard for electronic exchange of patient medical record information promises to simplify the transmission of such information between healthcare organizations. However, this endorsement also empowers HL7 to serve as the architect of the electronic health record. In this article, learn more about HL7 and what role you can play in standards development.

Imagine how the delivery of healthcare would change if a patient's history and physical exam (H&P) could be sent automatically to another facility providing treatment to that patient. The H&P could be transmitted directly from one electronic health record system to the other, despite the facilities' use of different software programs. Diagnostic information and dates from the H&P could then be incorporated into the receiving system and relevant information used for billing. Human intervention would be minimal, if needed at all. Think of the time saved without having to e-mail, print, copy, fax, mail, or reenter the patient's information.

What would it take to make this a reality? Standards for the content, format, and exchange of electronic health records information.

For more than six years, the federal government has been defining regulations to support the electronic transfer of health information mandated under the administrative simplification provisions of HIPAA. Recently, the National Committee on Vital and Health Statistics (NCVHS) endorsed Health Level Seven (HL7) as the standard for the electronic exchange of patient medical record information (PMRI). HL7 is a standards development organization accredited by the American National Standards Institute (ANSI) that provides standards for electronic communication between healthcare information systems. Through NCVHS' endorsement, HL7 will play a pivotal role in defining the content and format of the electronic health record (EHR) within the healthcare industry. This article will explore the basics of HL7 standards, why HL7 was selected, and what this endorsement means for healthcare institutions and HIM.

Why Do We Need Standards?

To fully automate systems and functions within and between healthcare organizations, a variety of different programs developed by multiple vendors must be used. However, to realize the efficiencies gained through computerization, disparate software programs must be able to communicate and share relevant information. This is accomplished through messaging (or communication) standards used by software vendors and application developers. Messaging standards allow one software program to communicate information to another system and have the information be understood.

For example, when a patient goes to an outpatient rehab department in a healthcare organization for treatment, the rehab system automatically queries the ADT (admission, discharge, transfer) system for relevant demographic information and dates. The information is automatically incorporated into the rehab department's information system without reentry. In turn, the new admission date for rehab services is communicated from the rehab system to the ADT system. This is possible because both systems are compliant with HL7 messaging standards that allow the information to be exchanged.

Compliance with the messaging standards means data is transmitted and received in a specific, structured form. Most demographic information used in healthcare has a standard format developed by HL7 to allow communication. For example, a patient's date of birth must be communicated between systems in this format: yyyymmdd. When it is received by another HL7-compliant system, the system can then populate the relevant date of birth field and be displayed as mm/dd/yyyy.

Transmitting demographic information is only half the battle, though. The lack of structure and standards has made the electronic transfer of PMRI more difficult: a computer can receive a textual progress note, but not interpret its meaning. For communication to occur, medical record information will have to be communicated in a standard format with standard definitions. That's where the NCVHS endorsement of HL7 comes in.

A Standard for Every Transaction

At the request of the secretary of HHS, NCVHS identified the standards to be used in various HHS data exchange initiatives in February 2002. The evaluation criteria included:

- degree of market acceptance
- degree of enabling interoperability
- ability to facilitate comparability of data
- ability to support data quality analysis

In specific areas, specialized standards are recommended. For example, for healthcare insurance claims, NCVHS recommends X12, the uniform electronic data interchange standards from the Accredited Standards Committee (ASC) X12. For imaging, it endorses DICOM (Digital Imaging and Communications in Medicine) standards. For retail prescriptions claims transactions, NCVHS recommends the NCPDP (National Council on Prescription Drug Programs) standards. NCVHS endorsed HL7 as the core standard for the PMRI message format that encompassed several transaction sets:

- order entry (observation, pharmacy, dietary, and supplies)
- scheduling (appointment scheduling and resources)
- medical records/information management (document management services and resources)
- patient administration (admission, discharge, and transfer transactions)
- observation reporting (observation report messages)
- financial management (patient accounting and charges)
- patient care (problem-oriented records)

An Evolving Standard

As HL7 standards have evolved, different version numbers have been assigned. NCVHS recognized how quickly the standards can change and recommended several versions of HL7 messaging standards. The committee recommended that HHS recognize current HL7 versions 2.2, 2.3, 2.4, and any future 2.x standards. Version 2.5 is now in the general ballot phase, during which the entire HL7 membership can review and approve the standard. Version 2.5 is expected to be published in the next six months. Each of the versions in this 2.x set is compatible with the previous versions in the 2.x family of standards. The current standards are available on CD-ROM through HL7.

Each successive version of the standard builds onto the previous version by developing new messaging standards for new data elements/applications or clarifies the meaning and intended use of a previous message. In some cases, a committee may determine that older standards are "deprecated," meaning they are no longer recommended for use in favor of a newer, better way. Sometimes a more subtle change occurs between versions. The definitions and use case examples are refined to permit a clearer view of what is intended.

NCVHS also recommended that HL7 version 3 be recognized as an emerging standard and that HHS provide incentives (such as funding publication of HL7 version 3 implementation guides and the development of conformance tests) to accelerate the development and early adoption of HL7 version 3, because it has the potential to "provide superior levels of interoperability and data comparability."1 Version 3 graphically describes the messaging standards and the relationships between data elements and exchange of information rather than using text, as in version 2.x.

Uniformity Is the Goal

When HHS developed the basic HIPAA transaction set, X12 was the standard chosen for claims processing. These transactions are mandated for use by the Centers for Medicare & Medicaid Services (CMS) for claims beginning October 16, 2003. Generally, what the federal government requires is also quickly adopted in the private sector. As a result, these same

transactions might soon be employed in private insurance if only to streamline claims processing because many private insurance companies act as claims intermediaries.

One important aspect of the claims process is the payer's ability to request attachments to facilitate payment of the claim. Put simply, the payer can request information in the patient's chart that is needed to determine the appropriateness of the claim. Any data or document in the patient's chart can be used for claims adjudication. To electronically transport this type of patient medical record data, HHS chose HL7 messaging standards for communication of the clinical content rather than X12. For the sake of uniformity, the HL7 content will be "wrapped" in an overall X12 transaction, meaning that the header and footer of the message, which identify the message, source, individual, and document, will be in X12, while the content of the message will be in HL7.

Compliance Is a Necessity

When selecting a software vendor, it is critical to require HL7 compliance to ensure communication and sharing of data between different programs or applications. A useful way to evaluate vendors' messaging ability is to require them to fill out the implementation guide comparison worksheet for each message they support as a sender or receiver. The institution can then determine which vendors support specific data items, because not all data items are required. HL7 designates each data field as either required, conditional, or optional. "Conditional" means that a field is required in some specified circumstances and optional in others. Vendors can elect not to support optional fields and still be considered HL7 compliant.

The implementation guide is a good way to document the institution's ability to send messages to new applications or to conform with new reporting requirements. The healthcare institution can interpret the standard and resolve any conflicts between message participants in a way that meets the institution's needs. For example, a conflict could arise if one vendor opts to support an optional field that another vendor does not support.

Who Develops the Standards?

The members of HL7 are the key developers of the messaging standards. Members meet regularly throughout the year to discuss the standards, make revisions, or create new standards. Within HL7 are technical committees and special interest groups to address the unique needs of a particular area. For example, a medical records/information management technical committee, vocabulary technical committee, and an EHR special interest group meet to discuss unique issues and needs for communication standards in their respective areas.

Traditionally, HL7 membership and attendance at meetings has been dominated by those with a technical background in software and message development. However, to create the most accurate standard, the technical knowledge must be balanced with savvy professionals who understand the intricacies of day-to-day healthcare operations. When NCVHS recommended HL7 as the core messaging standard for PMRI, it gave HL7 members the ability to determine the structure and data definitions for the EHR. To have a say in the EHR's development, HIM professionals must increase their involvement in HL7.

By making formal recommendations for standards to accelerate the exchange of PMRI, NCVHS sent a message to the healthcare industry: true administrative simplification and efficiencies won't be gained until medical record information can be communicated electronically between all the players in healthcare.

Note

1. "NCVHS Recommends That HL7 Be Recognized as the Core PMRI Messaging Standard." Letter to Tommy G. Thompson from NCVHS, February 27, 2002. Available online at www.hl7.org/press/PMRIletter2-27-02.doc.

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What Is NCVHS?

Although the HIPAA regulations are established by HHS, the secretary of HHS relies on several committees to recommend measures to be included in the regulations. In particular, congress established the National Committee on Vital and Health Statistics (NCVHS) as a statutory public advisory body to the secretary of HHS. The committee provides expert advice and assistance to the department and acts as a forum for input from the private sector on related health issues. The scope of this committee includes health statistics, health data security, population-based public health, computerized health information systems, and health data standards. The committee is made up of 18 individuals from the private sector, two appointed by congress, and 16 by the secretary of HHS, each serving a four-year term. They hold open meetings and meeting minutes, in addition to their formal submissions to the secretary, can be found on the NCVHS Web site at http://ncvhs.hhs.gov/.

Why You Need to Get Involved

For HL7 to establish uniform computer messaging standards, it must also:

- establish the order or sequence of the transmitted data
- define the characters used to differentiate the data items
- establish uniform formats for each data element
- define each data element
- define trigger events
- write use case models for the use and disclosure of information

Thus, in the process of developing a standard messaging format, HL7 is also defining the EHR content, format, and use. Once these standards are accepted and in use, it will be difficult—if not impossible—to alter any of them.

It's in HIM professionals' best interest to participate in the development of the HL7 standards, so we can influence the look, feel, and use of the EHR. In recognition of HL7's growing role in the standards development arena and development of the electronic patient record, AHIMA increased attendance at HL7 meetings by sending more staff to cover key committees and special interest groups. Still, an even stronger HIM presence—from professionals with either operational or technological experience—is critical to developing workable standards. For more information on how to get involved, contact Harry Rhodes (harry.rhodes@ahima.org) or Michelle Dougherty (michelle.dougherty@ahima.org).

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