

## Technology and Standards for Health Care

Messaging Standards	Used for:
HL7	Clinical data
X12N	Financial data, HIPAA mandated transactions
DICOM	Images
NCPDP	Prescription from providers to pharmacies
IEEE	Bedside instruments, medical information bus
Terminology Standards	
LOINC	
Drugs	NLM/FDA/VA collaboration on RxNorm, NDF-RT
Billing	CPT, ICD-9CM
Clinical	UMLS, SNOMED and others

Table adopted from Stan Huff MD, HIMSS, 2003

## Standards and Standards Organizations

### **American Society for Testing and Materials (ASTM)**

A component of the American National Standards Institute (ANSI) that has a subcommittee ([E31](#)) for general healthcare informatics. This E31 Subcommittee on Healthcare Informatics develops standards related to the architecture, content, storage, security, confidentiality, functionality, and communication of information used within healthcare and healthcare decision making, including patient-specific information and knowledge.

URL: [www.astm.org](http://www.astm.org)

### **Current Procedural Terminology (CPT)**

CPT® Current Procedural Terminology was developed by the American Medical Association in 1966. These codes are used for the billing of medical procedures. Each year, an annual publication is prepared, that makes changes corresponding with significant updates in medical technology and practice. The most recent version of CPT, CPT 2003, contains 8,107 codes and descriptors.

URL: <http://www.ama-assn.org/ama/pub/category/3113.html>

### **Digital Imaging and Communications in Medicine (DICOM)**

The Digital Imaging and Communications in Medicine (DICOM) Standard was developed for the transmission of images and is used internationally for Picture Archiving and Communication Systems (PACS). This standard was developed by the joint committee of the ACR (the American College of Radiology) and NEMA (the National Electrical Manufacturers Association) to meet the needs of manufacturers and users of medical imaging equipment for interconnection of devices on standard networks.

URL: [www.xray.hmc.psu.edu/physresources/dicom/basicinfo.html](http://www.xray.hmc.psu.edu/physresources/dicom/basicinfo.html)

### **Health Level 7 (HL7)**

HL7 is an accredited ANSI standard organization that produces the HL7 messaging standard. It is the accepted *messaging standard* for communicating clinical data. It is supported by every major medical informatics system vendor in the US. The HL7 mission is to provide a comprehensive framework and related standards for the exchange, integration, sharing, and retrieval of electronic health information that supports clinical practice and the management, delivery and evaluation of health services. Specifically, to create flexible, cost effective standards, guidelines, and methodologies to enable healthcare information system interoperability and sharing of electronic health records. The HL 7 Reference Information

Model (RIM) is an object model with a large pictorial representation of the clinical data (domains) and identifies the life cycle of events that a message or groups of related messages will carry.

URL: [www.hl7.org](http://www.hl7.org)

#### **Health Information Standards Board (HISB)**

A subgroup of the American National Standards Institute (ANSI). The American National Standards Institute's Healthcare Informatics Standards Board (ANSI HISB) provides an open, public forum for the voluntary coordination of healthcare informatics standards among all United States' standard developing organizations. Every major developer of healthcare informatics standards in the United States participates in ANSI HISB. The ANSI HISB has 27 voting members and more than 100 participants, including ANSI-accredited and other standards developing organizations, professional societies, trade associations, private companies, federal agencies, and others.

URL:

[www.ansi.org/standards\\_activities/standards\\_boards\\_panels/hisb/overview.aspx?menuid=3](http://www.ansi.org/standards_activities/standards_boards_panels/hisb/overview.aspx?menuid=3)

#### **Institute of Electrical and Electronics Engineers, Inc (IEEE)**

Sets standards for computers and languages

URL: <http://standards.ieee.org/resources/index.html>

#### **The IOM Committee on Patient Safety Data Standards**

This group within the Institute of Medicine has the charge of producing a detailed plan to facilitate the development of data standards applicable to the collection, coding, and classification of patient safety information.

URL: [www.iom.edu/psds](http://www.iom.edu/psds)

#### **International Classification of Diseases (ICD-9CM)**

The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) was developed in the United States to provide a way to classify morbidity data for indexing of medical records, medical case reviews, and ambulatory and other medical care programs, as well as for basic health statistics. It is based on the World Health Organization (WHO) international ICD-9. A version based on ICD-10 (ICD-10-CM) is in preparation.

URL: <http://www.who.int/whosis/icd10/othercla.htm>

#### **Logical Observations: Identifiers, Names, Codes (LOINC)**

Coding system for the electronic exchange of laboratory test results and other observations. LOINC development involved a public-private partnership comprised of several federal agencies, academia, and the vendor community. This model can be applied to other standards setting domains.

URL: [www.loinc.org](http://www.loinc.org)

#### **MedBiquitous**

MedBiquitous is the ANSI-accredited developer of information technology standards for healthcare education and competence assessment. Our XML and Web Services Standards enable communications among diverse entities in professional medicine and provide opportunities to seamlessly support the clinician learner. MedBiquitous has developed standards for healthcare learning objects (HLOs), discrete units of online instruction that may be used at the time of need, as well as standards for communicating clinician profile information, education and certification activities, journal information, and educational metrics. These standards will facilitate collaboration across organizations and make it easier to track licensure, certification, and educational changes or activities.

URL: <http://www.medbiq.org>

#### **National Council for Prescription Drug Programs (NCPDP)**

Founded in 1978, the NCPDC focuses on prescription drug messages and works to create and promote data interchange and processing standards for the pharmacy services sector of the health care industry. This is the standard for billing retail drug sales. The NCPDP is currently working on a standard for physicians to submit prescriptions electronically.

URL: [www.ncdp.org](http://www.ncdp.org)

### **National Drug File Reference Terminology (NDF-RT) and RxNorm**

The NDF-RT and the RxNorm projects are focused on improving interoperability of drug terminology. The area of clinical drugs is seen as important in the growing issues of patient safety; The National Drug File, Reference Terminology is being developed for the Veterans Administration as a reference standard for medications to support a variety of clinical, administrative and analytical purposes. The RxNorm Project is a developing project of the NLM where new concepts are being added to the UMLS for clinical drug representations.

### **Systematized Nomenclature of Medicine (SNOMED)**

SNOMED-CT (Clinical Terminology) has been created from the combination of SNOMED-RT (Reference Terminology) and Read codes. NLM and others are working to bring coding systems such as this SNOMED-CT (clinical terms) into the public domain

URL: [www.snomed.org/](http://www.snomed.org/)

### **Unified Medical Language System (UMLS) Metathesaurus**

The UMLS is a long term research and development project of the National Library of Medicine (NLM) that began in 1986. This project develops and distributes multi-purpose, electronic "Knowledge Sources" and associated lexical programs. System developers can use the UMLS products to enhance their applications -- in systems focused on patient data, digital libraries, Web and bibliographic retrieval, natural language processing, and decision support. Researchers will find the UMLS products useful in investigating knowledge representation and retrieval questions.

URL: <http://www.nlm.nih.gov/research/umls/>

### **X12N**

Dominant standard for electronic commerce. The American National Standards Institute Accredited Standards Committee X12 (ASC X12) selected X12N as the standard for electronic data interchange (EDI) used in administrative and financial health care transactions (excluding retail pharmacy transactions) in compliance with the Health Insurance Portability and Accountability Act of 1996. Used for external financial transactions, financial coverage verification and insurance transactions and claims.

URL: [www.x12.org/x12org/index.cfm](http://www.x12.org/x12org/index.cfm)

Information provided by the National Health Information Infrastructure (NHII)

<http://aspe.hhs.gov/sp/nhii/index.html>