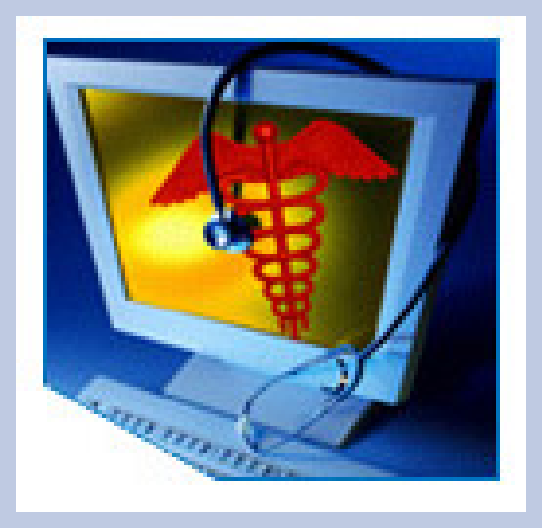
October 20, 2006
Version 1.0

HITSP Interoperability Specifications:
Electronic Health Records Laboratory Results Reporting HITSP/IS-01
Biosurveillance HITSP/IS-02
Consumer Empowerment HITSP/IS-03

Executive Overview



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FOREWORD

This document introduces the first set of Interoperability Specifications developed as an artifact of the Healthcare Information Technology Standards Panel (HITSP) standards harmonization process. An Interoperability Specification is a suite of documents that provides implementation level guidance that will:

- Identify standards and specific implementation context for those standards
- Describe specific value sets for unambiguous data exchange and system to system interaction
- Provide the necessary instruction to implement the specific standards in commercial and self-developed systems.

The American Healthcare Information Community charged the HITSP with harmonizing health interoperability standards for three specific situations:

- ***Electronic Health Records***: Allow ordering clinicians to electronically access laboratory results, and allow non-ordering authorized clinicians to electronically access historical and other laboratory results for clinical care.

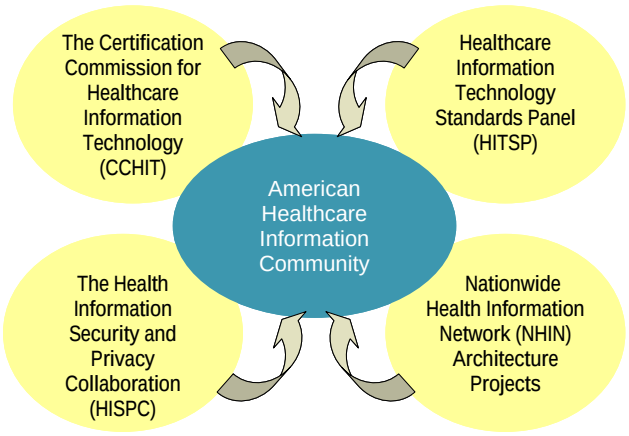
- ***Biosurveillance:*** Transmit essential ambulatory care and emergency department visit, utilization, and lab result data from electronically enabled health care delivery and public health systems in standardized and anonymized format to authorized Public Health Agencies with less than one day lag time.

- ***Consumer Empowerment:*** Allow consumers to establish and manage permissions access rights and informed consent for authorized and secure exchange, viewing, and querying of their linked patient registration summaries and medication histories between designated caregivers and other health professionals.

The following paragraphs provide background information about the HITSP and its role in the overall U.S. efforts to realize large scale interoperability of health information. It also describes the HITSP process for health standards harmonization. If you are familiar with HITSP, please proceed to the next major section titled – Executive Overview.

U.S. Nationwide Health Information Interoperability

Studies published by the Institute of Medicine and others have raised awareness of the extent to which the fragmented nature of clinical information adversely impacts the quality of care across the U.S. health IT can be used to enable better integration of clinical information. However, as of 2006, only a small number of U.S. healthcare providers have fully adopted health IT due, in part, to technical barriers associated with a lack of unambiguous and nationally recognized interoperability standards.



The American Health Information Community[1] (AHIC), a 2005 federally-chartered commission made up of leaders from public and private health sectors, was formed to provide recommendations on how to make health records digital and interoperable, and assure that the privacy and security of those records are protected, in a smooth, market-led way. At the same time, the Department of Health and Human Services, through the Office of the National Coordinator for Health IT (ONC) awarded contracts to 1) identify interoperability standards to facilitate the exchange of patient data (HITSP), 2) define a process for certifying that health IT products comply with appropriate standards The Certification Commission for Healthcare Information Technology (CCHIT), and 3) develop a series of prototypes to establish the requirements of a Nationwide Health Information Network (NHIN). These activities share the goal of widespread adoption of interoperable electronic health records within 10 years through public-private collaboration.

HITSP's Role within Nationwide Interoperability Efforts

The HITSP[2] is a multi-stakeholder coordinating body designed to provide the process within which affected parties can identify, select, and harmonize standards for communicating healthcare information throughout the healthcare spectrum. As used by HITSP, the term "standard" refers, but is not limited to:

- Specifications
- Implementation Guides
- Codes Sets
- Terminologies
- Integration Profiles

HITSP functions as a partnership of the public and private sectors and operates with a neutral and inclusive governance model administered by the American National Standards Institute. The goal of the Panel is to:

- Facilitate the development of harmonized Interoperability Specifications (IS) and information policies, including Standards Development Organization (SDO) work products (e.g. standards, technical reports). These policies, profiles and work products are essential for establishing privacy, security and interoperability among healthcare software applications
- Coordinate, as appropriate, with other national, regional and international groups addressing healthcare informatics to ensure that the resulting standards are globally relevant
- Be Use Case driven, using information from stakeholders and basing decisions on industry needs

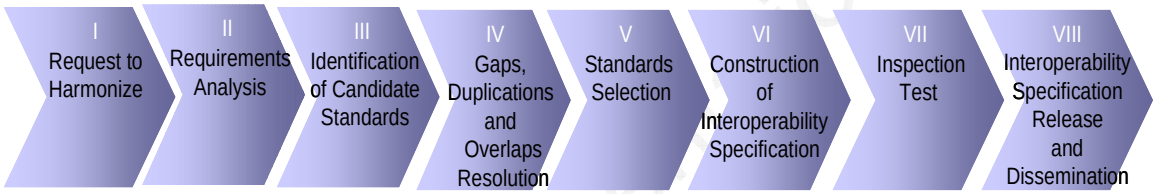
[1] http://www.hhs.gov/healthit/ahic.html
[2] www.hitsp.org

The work of HITSP is conducted through formally chartered Technical Committees of volunteer members. The artifact of the Technical Committee activities is an Interoperability Specification (IS) and related documents referred to as IS Transaction Packages, IS Transactions, or IS Components.

How Use Cases and HITSP Interoperability Specifications are Developed

The American Health Information Community (AHIC), as the representative of public and private health sector stakeholders, identified the three Use Cases (available at www.hitsp.org) that drove the initial efforts of the HITSP. Nationwide public and private health sector priorities continue to focus the efforts of the HITSP. The Use Case driven HITSP harmonization process is implemented by formally chartered Technical Committees. The volunteers that comprise a Technical Committee follow an 8 step process, depicted in the figure below.

HITSP Harmonization Process Steps



The current version of each Interoperability Specification has been approved by the HITSP as *Ready for Implementation Testing*, which is the first action in Step VIII, Interoperability Specification Release and Dissemination. Upon successful completion on the Implementation Testing, the Interoperability Specifications will be considered *Ready for Implementation.*

EXECUTIVE OVERVIEW

Each Interoperability Specification (IS) is actually a suite of documents that, taken as a whole, provide a detailed map to existing standards and specifications that will satisfy the requirements imposed by a given Use Case. It identifies and constrains standards where necessary, and creates groupings of specific actions and actors to further describe the relevant contexts. Where gaps and overlaps are identified, the Interoperability Specification provides recommendations and a roadmap for corrections to be made. Each Interoperability Specification includes IS Transaction Packages, IS Transactions, and IS Components relevant to a specific Use Case. In all there are 23 documents that make up the three Interoperability Specifications. Of the 23 documents, eight are referenced by multiple Interoperability Specifications. This modular approach will support future re-use of HITSP artifacts.

The Interoperability Specifications summarized in this document can be retrieved from the HITSP website using the following links:

Electronic Health Record Laboratory Results Reporting HITSP/IS-01

Biosurveillance HITSP/IS-02

Consumer Empowerment HITSP/IS-03

For each Interoperability Specification, this executive overview provides the business problem to be addressed, highlights the prominent challenges encountered and describes how they were resolved, and lists the HITSP recommended standards selected to meet the requirements of each Use Case.

ELECTRONIC HEALTH RECORD (EHR) LABORATORY RESULTS REPORTING

This Interoperability Specification is designed to meet the specific requirements of sending laboratory results to clinicians for patient care. Lack of harmonization among data interoperability standards including vocabulary and laboratory and other messaging standards, contributes to duplicate and unnecessary laboratory testing. Both of which impact the quality and cost of healthcare.

The HITSP EHR Interoperability Specification is relevant to clinical care providers who wish to have laboratory test results and laboratory interpretations electronically available for patients for whom they are providing care. Laboratory test results and interpretations are available for integration into an electronic health record (EHR), local or remote, or another clinical system. The Use Case includes two scenarios that cover typical interfaces involving an EHR system (or equivalent) and laboratory results.

The HITSP EHR Interoperability Specification describes both a laboratory message transaction and a document sharing paradigm. Ordering providers of care always receive results as a laboratory message, non-ordering providers of care access historical laboratory results as documents, and "copy-to" providers

of care may receive either messages or document availability notifications. The dual path of message and document provides a greater degree of implementation flexibility.

Challenges

The EHR Technical Committee has identified gaps in terminology standards for reporting laboratory results. These gaps are minimized by the selection of standards that give the widest coverage, but vocabulary domains with clinical content are very large and encompass many specialties. The innovation in healthcare informatics is fast-paced, resulting in gaps as the standards attempt to catch up. In addition to gaps, there is a significant overlap. This overlap is well understood and monitored by the sponsoring SDO. A mapping from the Health Level Seven (HL7) Version 2.5 ORU^R01 message to the Integrating the Healthcare Enterprise (IHE) Laboratory Technical Framework XD*-LAB constrained HL7 Clinical Document Architecture (CDA) document is a necessary accessory to this specification. This mapping will be the basis for interoperability between messages and documents.

Transactions

The core transactions that comprise this Interoperability Specification include the following:

- ***Send Laboratory Result:*** This includes all the data definitions and interactions for the HL7 V2.5 Laboratory Result Message. It relies on two components:
  - The Laboratory Result Message Component (HITSP/ISC-36) specifies constraints on the HL7 V2.5 message and
  - The Laboratory Result Terminology Component (HITSP/ISC-35) describes the vocabulary constraints

- ***Manage Sharing of Documents:*** This is a generic document-sharing paradigm that can be used for any electronic document. For this specification, the specific document of interest is the HL7 CDA specification based on the Integrating the IHE Laboratory Technical Framework XD*-LAB. The HITSP Laboratory Report Document Structure Component Specification (HITSP/ISC-37) describes the Laboratory CDA document and the Laboratory Result Terminology Component (HITSP/ISC-35) describes the vocabulary constraints

Ancillary transactions address Web Services, Notification of Document Availability, Patient Demographics Query (PDQ) and Patent ID Cross-Referencing (PIX).

Recommended Standards

The Interoperability Specification is the result of an assessment of the current practices in electronic laboratory results reporting and the requirements of the EHR Use Case. The EHR Technical Committee (EHR TC) chose this combination of standards because they meet the requirements of the Use Case and reflect both current practice and future directions for healthcare information sharing.

The following table lists the standards selected to implement the entire ONC harmonized Use Case for EHR LAB. It is important to note that the industry use of HL7 v3.0 and HL7 2.5 standards is evolving, and the expectation is that these standards will become more broadly used. The HL7 Clinical Document Architecture (CDA) is a document markup standard that specifies the structure and semantics of "clinical documents" for the purpose of exchange. The CDA Release 2.0 distribution includes a prose document in HTML, XML schemas, data dictionary, and sample CDA documents. The HL7 CDA Release 2.0 is a limited subset of HL7 V3. It builds upon other HL7 standards, including the HL7 Reference Information Model (RIM), Data Structures, Vocabulary, and the XML Implementation Technology Specifications for Data Types and V3 Structures. This Implementation Specification does not imply a full adoption of HL7 V3, but just refers to HL7 CDA R2 and the limited subset of HL7 V3 artifacts used by HL7 CDA R2.

Recommended Standards
Clinical Laboratory Improvement Amendments (CLIA) of 1988
Health Insurance Portability and Accountability Act (HIPAA) -- Administrative Simplification
Health Level Seven (HL7) Version 2.5
Health Level Seven (HL7) Version 3.0 Clinical Document Architecture (CDA/CDA R2)
Integrating the Healthcare Enterprise (IHE) Laboratory Technical Framework Supplement 2006-2007 Revision 1.0
Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 2.0
International Organization for Standardization (ISO) Electronic business eXtensible Markup Language (ebXML), Technical Specification # 15000 -- Part 4: Registry services specification (ebRS), May, 2004
Logical Observation Identifiers Names and Codes (LOINC®)
Systematized Nomenclature of Medicine – Clinical Terms (SNOMED CT®)
Unified Code for Units of Measure (UCUM)

BIOSURVEILLANCE

This Interoperability Specification is designed to meet the specific requirements of the Biosurveillance Use Case, defined as implementation of near real-time, nationwide public health event monitoring to support early detection, situational awareness, and rapid response management across care delivery, public health, and other authorized Government agencies.

The scope addressed in the Interoperability Specification is the transmission of essential data from ambulatory care and emergency department visits, utilization, and lab result data from electronically enabled healthcare delivery and public health systems in a standardized and anonymized format, to authorized Public Health Agencies with less than one day lag time. While the system and processes ultimately must also support the ability for authorized public health personnel to go back to the data source to seek to re-link the anonymized biosurveillance data to the data source as part of an appropriate public health investigation, such re-linking has been deferred for future effort.

The management of data to ensure proper routing, security, privacy, and timely reporting is critical to enabling biosurveillance activities. Potential architectural solutions to data flow issues include using

individual facility data sources (e.g., single hospitals or ambulatory care sites) or networked system such as a multi-facility system or supporting organization that uses data in the course of providing other services and sends data to all appropriate public health agencies. Other permutations of these two models can also be considered. The role of the data or network system can be accomplished by several different stakeholders, including hospital systems, health plans, independent laboratories, and other possibilities. However, this IS was defined to be independent of architecture choice and is intended to support any variant of the architectural choices identified above.

Challenges

The Biosurveillance Technical Committee has focused its work around an analysis of the Biosurveillance Use Case provided by the American Health Information Community (AHIC). This work has also been informed by the proceedings of the AHIC Biosurveillance Data Steering Group (BDSG). Even so, an implementer of this Interoperability Specification must provide the technical infrastructure and security framework necessary to support operations in accordance with law, regulation, best practices and business agreements.

The Technical Committee worked with the United States Health Information Knowledgebase to evaluate the metadata and repository for use in standards selection using demographic and encounter data as a test case. The results and the resource will be used to extend this Interoperability Specification to additional domains and clinical data information exchange standards.

The BIO Technical Committee has selected standards with more options than might otherwise be defined between communication partners. As Biosurveillance is based upon secondary use of clinical data, the processes and data capture options are somewhat opportunistic, and associated data mining processes have more latitude in translation and data preparation processes. Since it is important to maximize the data sources to contribute data to the biosurveillance information system, information exchange selections include options for data capture from both legacy environments and emerging environments. Vocabulary, message, and content standards have been selected in consideration of providing the most comprehensive, machine process able fulfillment of the data requirements provided by the AHIC BDSG.

Transactions

The core transactions that comprise this Interoperability Specification include the following:

- ***Pseudonymize Data:*** Apply a common standard to Codify Document Content, Anonymize or Pseudonymize patient data to protect patient identity from undesired disclosure when communicating care data to/from external parties.

- ***Anonymize Data:*** Apply a common standard to Codify Document Content, Anonymize or Pseudonymize patient data to protect patient identity from undesired disclosure when communicating care data to/from external parties.

Ancillary transactions address Manage Sharing of Documents, Retrieve Form from Data Capture,

Notification of Document Availability, Acknowledgements, and Patent ID Cross-Referencing (PIX).

Recommended Standards
American Medical Association (AMA) Current Procedural Terminology (CPT®) Fourth Edition (CPT-4)
Clinical and Laboratory Standards Institute (CLSI) [formerly the National Committee for Clinical Laboratory Standards (NCCLS)]
Clinical Care Classification (CCC) Version 2.0 [formerly known as the Home Healthcare Classification (HHCC) System]
Clinical Laboratory Improvement Amendments (CLIA) of 1988
College of American Pathologists Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT®)
Digital Imaging and Communications in Medicine (DICOM) Attribute Level Confidentiality Supplement: # 55
Federal Information Processing Standards (FIPS) Codes for the Identification of the States, the District of Columbia and the Outlying Areas of the United States, and Associated Areas Publication # 5-2, May, 1987
HCPCS Level II Code Set
Health Insurance Portability and Accountability Act (HIPAA) -- Administrative Simplification
Health Level Seven (HL7) Version 2.5
Health Level Seven (HL7) Version 3.0 Clinical Document Architecture (CDA/CDA R2)
Integrating the Healthcare Enterprise (IHE) Laboratory Technical Framework Supplement 2006-2007 Revision 1.0
Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 2.0
Integrating the Healthcare Enterprise (IHE) Patient Care Coordination (PCC) Technical Framework Revision 1.0
Integrating the Healthcare Enterprise (IHE) Radiology Technical Framework Revision 7.0
International Classification of Diseases, Ninth Edition, Clinical Modifications (ICD-9-CM)
International Classification of Diseases, 10th revision, Related Health Problems (ICD-10 CM)
International Organization for Standardization (ISO) Health Informatics -- Pseudonymization, Unpublished Technical Specification # 25237
Logical Observation Identifiers Names and Codes (LOINC®)
National Library of Medicine (NLM) Unified Medical Language System (UMLS) RxNorm
National Uniform Billing Committee (NUBC) Uniform Bill Version 1992 (UB-92)/Current UB Data Specifications Manual
Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) Hospital AVailability Exchange (HAVE)
Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) Distribution Element (DE)
Unified Code for Units of Measure (UCUM)

CONSUMER EMPOWERMENT

Consumer Empowerment is the active involvement of consumers (i.e., individuals) in managing their healthcare and gaining the benefits of having their health information in a format easily accessible to them. This includes having a personal health record (PHR) to track patient information, insurance, family history, medications, and other special conditions.

As part of a personal health record, this Interoperability Specification addresses two key areas: the patient's registration data and medication history.

A vital part of a personal health record is registration information. Going to the doctor or hospital frequently requires filling out multiple forms. These forms collect information such as name, address, insurance, medications, allergies, etc. Then, when an individual requires laboratory work or other testing, the same information has to be collected again. A single electronic registration will make it easier for individuals to give their information and for clinicians to use it. Additionally, the consumer could update the information once and share it with all healthcare providers.

An electronic medication history provides the consumer with an updated list of all pertinent medications and allergies in an easily accessible format. Most individuals do not know the specific medications and exact dosages that have been prescribed to them, and often do not know their allergies. In addition, clinicians do not always have consistent prescription information about the same individual nor do they have easy access to medication information directly from the patient. Too often, this results in errors or unnecessary treatments. An electronic medication history would have all the current data available to the individual and to each authorized healthcare provider. The need for an electronic medication history was highlighted by the high interest in the KatrinaHealth.org web tool. Having a complete electronic medication list would also prevent drug-to-drug or allergic reactions when subsequent prescriptions are written.

Based on the charge from the American Health Information Community, the Consumer Empowerment Use Case presumes some level of linkage between consumer's registration summary and their medication history. This linkage is an important consideration for identifying and locating individual consumers and their available medication information across network systems. For the purposes of this Use Case, the linking of a consumer's registration summary to the medication history includes: (1) identity matching, (2) linkages between the data, (3) and the ability to incorporate both types of data simultaneously into a system (although they may come from different systems themselves).

The Consumer Empowerment Interoperability Specification addresses three scenarios to satisfy the harmonized Use Cases defined by ONC. They are:

- Consumer creates account to host registration summary & medication history
- Consumer visits Healthcare Provider and provides registration summary information
- Authorized Healthcare Provider reviews medication history

This Interoperability Specification defines an interoperable registration and medication history document; one means of which to share this type of document is by registering them in a record locator and retrieving them from the referenced document repository. Some of the other HITSP Use Cases define other types of documents (e.g. a laboratory report in the EHR Use Case) which may also be used as part of information exchange to and from a consumer PHR). Other types of interoperable documents may be

defined by HITSP in the future for radiology reports, images, electrocardiogram (ECG) reports, etc. These other types of documents are out of scope of the current Use Case.

Challenges

The CE Technical Committee has been charged with introducing the consumer, and the PHR, as an integral partner of the healthcare information flow representing a new paradigm in healthcare interoperability. This paradigm establishes the consumer as the active participant in health information exchange that touches all segments of the industry; providers/care facilities, health plans, pharmacies/prescription benefit managers, and others. This challenge is exacerbated by the current information technology situation wherein providers, health plans, pharmacies, and pharmacy benefit manager industry segments each have created different standards based on differing business needs and timing, with shared and overlapping data elements via three different standards developers: HL7, ASC X12, and NCPDP SCRIPT.

In addition to these aforementioned standards, a fourth standard initiative from ASTM targeting the provider-provider and provider-consumer interoperability space, entitled the Continuity of Care (CCR), passed favorable ballot in October 2005. In the latter phase of the successful CCR balloting process, ASTM and HL7 initiated a formal harmonization effort regarding their respective efforts addressing the same interoperability space. This harmonization initiative resulted in the joint development of the Continuity of Care Document (CCD) which was issued as an HL7 ballot in August 2006.

The CE Technical Committee has determined that it is in the best interest of HITSP harmonization efforts to wholeheartedly support this HL7-ASTM harmonization initiative and leverage its deliverables to the highest degree possible. To this end, in the absence of having a balloted CCD standard to reference, the approach taken by the CE TC is to align its Interoperability Specification to the expected technical design characteristics of the CCD. This CE Interoperability Specification artifact is therefore intended to facilitate the transition from the current disparate standards environment to a harmonized state through use of a preliminary specification that is on the convergence path of the promised HL7-ASTM harmonization. HITSP is committed to migrate this preliminary specification to the final balloted result of this HL7-ASTM harmonization work as soon as it's officially available. The HITSP has set a target date of six months (i.e. March-April 2007) for the release of the final approved HL7 CCD. At this time the situation will be revisited and a determination will be made as to whether the publication of an interim HITSP Interoperability Specification is appropriate.

Transactions

The Consumer Empowerment Use Case includes:

- Enabling consumers to establish permissions and access rights for viewing their data
- Authenticating consumers, designated caregivers, and health professionals
- Querying other organizations for data and matching to the consumer
- Accepting "batch" data from other organizations and matching to the appropriate consumers

- Accessing, viewing, and sharing registration summaries and medication histories
- Recording of interactions to enable access and viewing tracking and generation of system logs.

Recommended Standards
Accredited Standards Committee (ASC) X12 Insurance Subcommittee (X12N) Implementation Guides Version 004010 plus Addenda 004010A1
Accredited Standards Committee (ASC) X12 Standards Release 004010
American Society for Testing and Materials (ASTM) Standard Specification for Continuity of Care Record (CCR): # E2369-05
Council for Affordable Quality Health Care (CAQH) Committee on Operating Rules for Information Exchange (CORE) Phase I Operating Rules
Federal Medication Terminologies
Health Level Seven (HL7) Version 3.0 Continuity of Care Document (CCD)
Health Level Seven (HL7) Version 3.0 Clinical Document Architecture (CDA/CDA R2)
Health Level Seven (HL7) Version 2.5
Health Level Seven (HL7) EHR System Functional Model Draft Standard for Trial Use (DSTU)
Integrating the Healthcare Enterprise (IHE) Laboratory Technical Framework Supplement 2006-2007 Revision 1.0
Integrating the Healthcare Enterprise (IHE) Patient Care Coordination (PCC) Technical Framework Revision 1.0
Logical Observation Identifiers Names and Codes (LOINC®)
National Council for Prescription Drug Programs (NCPDP) SCRIPT Standard Version 8.1

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HITSP refers you to hitsp.org for additional information about the HITSP, its charter, membership, and work products. You can contact the Panel Secretariat, Ms. Michelle Maas Deane, by phone at (212) 642-4884, or by email using mmaasdeane@ansi.org.

APPENDIX – COMPLETE LISTS OF STANDARDS

EHR LABORATORY RESULTS REPORTING LIST OF STANDARDS

Standard	Description
Clinical Laboratory Improvement Amendments (CLIA) of 1988	Establishes quality standards for all laboratory testing to ensure the accuracy, reliability, and timeliness of patient test results regardless of where the test is performed. The Centers for Medicare and Medicaid Services (CMS) regulates all laboratory testing (except research) performed on humans in the U.S. based on CLIA. Visit www.fda.gov/cdrh/clia and www.cms.hhs.gov/clia for more information.
Health Insurance Portability and Accountability Act (HIPAA) -- Administrative Simplification[3]	A listing of national standards plus rules adopted by federal regulation for electronically communicating specified administrative and financial healthcare transactions, and protecting the security and privacy of healthcare information, as applied to the three types of defined covered entities: health plans, healthcare clearinghouses, and healthcare providers who conduct any of the specified healthcare transactions. See the Code of Federal Regulations, Title 45, Parts 160, et. seq. for more information.
Health Level Seven (HL7) Version 2.5	The HL7 Version 2.5 Messaging Standard is an application protocol for electronic data exchange in healthcare. It and prior versions have widespread use in the US and internationally. Both message formats and value sets / code tables (e.g., diagnosis type, gender, patient class) are contained in the standard. Of particular focus for HITSP Interoperability Specifications are message formats described in Chapters 2, 3, 5, and 7 including patient demographic (ADT) and lab result reporting. These are also used within composite standards from IHE for Patient Identity Cross-Referencing and Feed (PIX), Patient Demographics Query (PDQ), and Acknowledgements. Visit http://www.hl7.org for more information.
Health Level Seven (HL7) Version 3.0 Clinical Document Architecture (CDA/CDA R2)	The HL7 Clinical Document Architecture is an XML-based document markup standard that specifies the structure and semantics of clinical documents for the purpose of exchange. CDA is one instantiation of HL7's Version 3.0 Reference Information Model (RIM) into a specific message format. Of particular focus for HITSP Interoperability Specifications are message formats for Laboratory Results and Continuity of Care (CCD) documents. Release 2 of the HL7 Clinical Document Architecture (CDA) is an extension to the original CDA document markup standard that specifies the structure and semantics of clinical documents for the purpose of exchange. CDA R2 includes a prose document in HTML, XML schemas, data dictionary, and sample CDA documents. CDA R2 further builds upon other HL7 standards beyond just the Version 3.0 Reference Information Model (RIM) and incorporates Version 3.0 Data Structures, Vocabulary, and the XML Implementation Technology Specifications for Data Types and Structures. Visit http://www.hl7.org for more information. Visit www.hl7.org for more information.
Integrating the Healthcare Enterprise (IHE) Laboratory Technical Framework Supplement 2006-2007 Revision 1.0	The IHE Laboratory Technical Framework introduces a content Integration Profile Sharing Laboratory Reports (XD*-LAB) that describes a clinical laboratory report as a human-readable electronic document. This document, which may also contain data in a machine-readable format and contains the complete set of final results produced by a clinical laboratory in fulfillment of one or more test orders for a patient. This document is focused on the sharing of sets of laboratory results in the form of a laboratory report structured document, and is not intended to address ordering or return of laboratory results to the ordering provider.
Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 2.0	The IHE IT Infrastructure Technical Framework defines specific implementations of established standards to achieve integration goals that promote appropriate sharing of health information to support optimal patient care. IHE Integration Profiles, offer a common

[3] Using the full Interoperability Specification, please refer to section 2.1 Overview for discussion of Standard Transactions and Codesets and to section 2.2.5 for information relating to HIPAA Security and Privacy

Standard	Description
	language that healthcare professionals and vendors may use in communicating requirements for the integration of products. The current version of the ITI-TF, rev. 2.0 for Final Text, specifies the IHE transactions defined and implemented as of August 2005. Of particular focus for HITSP Interoperability Specifications are Patient Identifier Cross-Referencing and Feed (PIX), Patient Demographics Query (PDQ), Cross Enterprise Document Sharing (XDS), and Notification of Document Availability (NAV) Integration Profiles. The latest version of the IHE Technical Framework is available at http://www.ihe.net/Technical_Framework.
International Organization for Standardization (ISO) Electronic business eXtensible Markup Language (ebXML), Technical Specification # 15000 -- Part 4: Registry services specification (ebRS), May, 2004	Describes eXtensible Markup Language (XML) and its usage characteristics. Consists of 4 parts: ebCPP, ebMS, ebRIM, and ebRS. Part 4 ebRS defines the interface between the registry and the registry clients, as well as the interaction protocols, message definitions and XML schema. Visit http://www.iso.org for more information.
Logical Observation Identifiers Names and Codes (LOINC®)	A database of Universal identifiers for laboratory and other clinical observations maintained by Regenstrief Institute. The laboratory portion of the LOINC database contains the usual categories of chemistry, hematology, serology, microbiology (including parasitology and virology), toxicology; etc. Contact the Regenstrief Institute at e-mail: loinc@regenstrief.org or visit www.regenstrief.org/loinc for more information.
Systematized Nomenclature of Medicine – Clinical Terms (SNOMED CT®)	A validated clinical healthcare terminology and infrastructure that makes healthcare knowledge more usable and accessible. The SNOMED CT Core terminology provides a common language that enables a consistent way of capturing, sharing and aggregating health data across specialties and sites of care. Among the applications for SNOMED CT are electronic medical records, ICU monitoring, clinical decision support, medical research studies, clinical trials, computerized physician order entry, disease surveillance, image indexing and consumer health information services. Maintained by the College of American Pathologists (CAP), information is available at www.snomed.org/snomedct/index.html.
Unified Code for Units of Measure (UCUM)	The Unified Code for Units of Measure is a code system intended to include all units of measure used in science, engineering, and business with the goal of facilitating unambiguous electronic communication of quantities together with their units.

BIOSURVEILLANCE LIST OF STANDARDS

Standard	Description
American Medical Association (AMA) Current Procedural Terminology (CPT®) Fourth Edition (CPT-4)	A uniform coding system used primarily to identify medical services and procedures furnished by physicians and other healthcare professionals. Visit http://www.ama-assn.org/ama/pub/category/3113.html for more information.
Clinical and Laboratory Standards Institute (CLSI) [formerly the National Committee for Clinical Laboratory Standards (NCCLS)]	A global, nonprofit, standards-developing organization that promotes the development and use of voluntary consensus standards and guidelines within the healthcare community. Visit http://www.nccls.org/ for more information.
Clinical Care Classification (CCC) Version 2.0 [formerly known as the Home Healthcare Classification (HHCC) System]	Provides a standardized framework and a unique coding structure for assessing, documenting, and classifying home health and ambulatory care. This system consists of two interrelated taxonomies: CCC of Nursing Diagnoses and CCC of Nursing Interventions classified by 21 Care Components that represent the Functional, Health Behavioral, Physiological, and Psychological Patterns of patient care. The 21 Care Components serve as a standardized framework for mapping and linking the two interrelated CCC taxonomies to each other and to other health-related classifications. Visit www.sabacare.com for more information.
Clinical Laboratory Improvement Amendments (CLIA) of 1988	Establishes quality standards for all laboratory testing to ensure the accuracy, reliability, and timeliness of patient test results regardless of where the test is performed. The Centers for Medicare and Medicaid Services (CMS) regulates all laboratory testing (except research) performed on humans in the U.S. based on CLIA. Visit http://www.fda.gov/cdrh/clia/ and http://www.cms.hhs.gov/clia/ for more information.
College of American Pathologists Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT®)	SNOMED CT consists of a technical design, core content architecture, and Core content. SNOMED CT Core content includes the technical specification of SNOMED CT and fully integrated multi-specialty clinical content. The Core content also includes a concepts table, description table, relationships table, history table, ICD-9-CM mapping, and Technical Reference Guide. Additionally, SNOMED CT provides a framework to manage language dialects, clinically relevant subsets, qualifiers and extensions, as well as concepts and terms unique to particular organizations or localities. Visit http://www.snomed.org/snomedct/index.html for more information.
Digital Imaging and Communications in Medicine (DICOM) Attribute Level Confidentiality Supplement: # 55	Adds a mechanism for selective protection of individual attributes within arbitrary DICOM service-object pair (SOP) instances. It may be used to achieve protection of identifying information, e.g. a reversible anonymization or pseudonymization of DICOM SOP instances while continuing to use unmodified lower level message and protocol services for network transfer, storage, and media exchange of composite image information objects. Visit http://medical.nema.org/ for more information.
Federal Information Processing Standards (FIPS) Codes for the Identification of the States, the District of Columbia and the Outlying Areas of the United States, and Associated Areas Publication # 5-2, May, 1987	A set of two-digit numeric codes and a set of two-letter alphabetic codes for representing the 50 states, the District of Columbia and the outlying areas of the United States, and associated areas. The standard covers all land areas under the sovereignty of the United States, the freely associated states of Federated States of Micronesia and Marshall Islands, and the trust territory of Palau. Visit http://www.itl.nist.gov/fipspubs/ for more information. NOTE: ASC X12 transactions and ASC X12N Implementation Guides do not allow use of this standard; instead they require use of the U.S. Postal Service's National Zip Code and Post Office Directory -- which provides similar alphabetic code values.
HCPCS Level II Code Set	Level II of the HCPCS is a standardized coding system that is used primarily to identify products, supplies, and services not included in the CPT codes (Level I of HCPCS) for billing purposes. In some cases a HCPCS code may be used to identify a unusual ordered service mapped to the AHIC data set. CMS maintains HCPCS codes.

Standard	Description
	http://www.cms.hhs.gov/MedHCPCSGenInfo/.
Health Insurance Portability and Accountability Act (HIPAA) -- Administrative Simplification	A listing of national standards plus rules adopted by federal regulation for electronically communicating specified administrative and financial healthcare transactions, and protecting the security and privacy of healthcare information, as applied to the three types of defined covered entities: health plans, healthcare clearinghouses, and healthcare providers who conduct any of the specified healthcare transactions. See the Code of Federal Regulations, Title 45, Parts 160, et. seq. for more information.
Health Level Seven (HL7) Version 2.5	The HL7 Version 2.5 Messaging Standard is an application protocol for electronic data exchange in healthcare. It has widespread use in the US and internationally. Both message formats and value sets / code tables (e.g., diagnosis type, gender, patient class, result status, specimen collection method, abnormal flags, observation result status codes interpretation, timestamp format) are contained in the standard. Of particular focus for HITSP Interoperability Specifications are message formats described in Chapters 2, 3, 5, and 7 for Patient Identifier Cross-Referencing and Feed (PIX), Patient Demographics Query (PDQ), Laboratory Results Reporting, and Acknowledgements. Visit www.hl7.org for more information.
Health Level Seven (HL7) Version 3.0 Clinical Document Architecture (CDA/CDA R2)	The HL7 Clinical Document Architecture is an XML-based document markup standard that specifies the structure and semantics of clinical documents for the purpose of exchange. CDA is one instantiation of HL7's Version 3.0 Reference Information Model (RIM) into a specific message format. Of particular focus for HITSP Interoperability Specificaitons are message formats for Laboratory Results and Continuity of Care (CCD) documents. Release 2 of the HL7 Clinical Document Architecture (CDA) is an extension to the original CDA document markup standard that specifies the structure and semantics of clinical documents for the purpose of exchange. CDA R2 includes a prose document in HTML, XML schemas, data dictionary, and sample CDA documents. CDA R2 further builds upon other HL7 standards beyond just the Version 3.0 Reference Informaiton Model (RIM) and incorporates Version 3.0 Data Structures, Vocabulary, and the XML Implementation Technology Specifications for Data Types and Structures. Visit www.hl7.org for more information.
Integrating the Healthcare Enterprise (IHE) Laboratory Technical Framework Supplement 2006-2007 Revision 1.0	The IHE Laboratory Technical Framework introduces a content Integration Profile Sharing Laboratory Reports (XD*-LAB) that describes a clinical laboratory report as a human-readable electronic document. This document, which may also contain data in a machine-readable format and contains the complete set of final results produced by a clinical laboratory in fulfillment of one or more test orders for a patient. This document is focused on the sharing of sets of laboratory results in the form of a laboratory report structured document, and is not intended to address ordering or return of laboratory results to the ordering provider.
Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 2.0	The IHE IT Infrastructure Technical Framework defines specific implementations of established standards to achieve integration goals that promote appropriate sharing of health information to support optimal patient care. IHE Integration Profiles, offer a common language that healthcare professionals and vendors may use in communicating requirements for the integration of products. The current version of the ITI-TF, rev. 2.0 for Final Text, specifies the IHE transactions defined and implemented as of August 2005. Of particular focus for this HITSP Interoperability Specification is Patient Identifier Cross-Referencing and Feed (PIX), Patient Demographics Query (PDQ), Cross Enterprise Document Sharing (XDS), and Notification of Document Availability (NAV) Integration Profiles. The latest version of the IHE Technical Framework is available at http://www.ihe.net/Technical_Framework.
Integrating the Healthcare Enterprise (IHE) Patient Care Coordination (PCC) Technical Framework Revision 1.0	The IHE Patient Care Coordination Technical Framework (PCC TF) defines specific implementations (called Integration Profiles) of established standards to deal with integration issues that cross providers, patient problems or time. The Exchange of Personal Health Record Content (XPHR) Integration Profile describes the content and format of summary information extracted from a PHR system for import into an EHR system, and vice versa. The purpose of this Integration Profile is to support interoperability between PHR systems used by patients and EHR systems used by

Standard	Description
	healthcare providers. The Cross Enterprise Document Sharing of Medical Summaries (XDS-MS) Integration Profile enables sharing of health information between enterprises of a regional health network. In the registry, healthcare providers publish pointers to documents stored in distributed repositories. Other healthcare providers may search and retrieve these and other documents.
Integrating the Healthcare Enterprise (IHE) Radiology Technical Framework Revision 7.0	The IHE Radiology Technical Framework specifies the Cross Enterprise Document Sharing for Imaging (XDS-I) Integration Profile which enables sharing of imaging documents such as radiology images and reports across healthcare enterprises. XDS-I extends XDS by sharing, locating and accessing DICOM instances from its original local sources, e.g. for radiologists or oncologists.
International Classification of Diseases, Ninth Edition, Clinical Modifications (ICD-9-CM)	A two part, three volume, coding system used to identify diseases and treatments. ICD-9-CM Volumes 1 and 2 describe codes for diseases, injuries, impairments, and other health problems; along with their causes. ICD-9-CM Volume 3 describes codes for procedures and actions taken for prevention, diagnosis, treatment, and management. Visit http://www.cdc.gov/nchs/ for more information.
International Classification of Diseases, 10th revision, Related Health Problems (ICD-10 CM)	The International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) is used for mortality statistics reporting. It is owned and published by the World Health Organization (WHO). The National Center for Health Statistics (NCHS) is responsible for use of the (ICD-10) in the United States and has developed a clinical modification of the classification for morbidity purposes. ICD-10-CM, has more codes and classifications and expanded ambulatory coverage compared to ICD-9-CM. ICD-10-CM is not yet approved for implementation in the US.
International Organization for Standardization (ISO) Health Informatics -- Pseudonymization, Unpublished Technical Specification # 25237	Health Informatics – Pseudonymisation. Still under development as of October, 2006. Scheduled for ballot December 2006. The HITSP Biosurveillance TC recognizes that ISO/DTS 25237 is a draft standard. An informal Liaison relationship is established to harmonize the ongoing work of this TC and assure consistency with this draft standard that we expect will continue to inform the work of this TC. Visit http://www.iso.org/iso/en/ISOOnline.frontpage for more information.
Logical Observation Identifiers Names and Codes (LOINC®)	A database of universal identifiers for laboratory and other clinical observations. The laboratory portion of the LOINC database contains the usual categories of chemistry, hematology, serology, microbiology (including parasitology and virology), and toxicology; as well as categories for drugs and the cell counts typically reported on a complete blood count or a cerebrospinal fluid cell count. Antibiotic susceptibilities are a separate category. The clinical portion of the LOINC database includes entries for vital signs, hemodynamics, intake/output, EKG, obstetric ultrasound, cardiac echo, urologic imaging, gastroendoscopic procedures, pulmonary ventilator management, selected survey instruments, and other clinical observations. Visit www.loinc.org for more information.
National Library of Medicine (NLM) Unified Medical Language System (UMLS) RxNorm	Provides standard names for (1) clinical drugs and (2) drug dose forms as administered to a patient. Also provides links from clinical drugs, both branded and generic, to their active ingredients, drug components (active ingredient + strength), and related brand names. Food and Drug Administration (FDA) National Drug Codes (NDCs) for specific drug products and many of the drug vocabularies commonly used in pharmacy management and drug interaction software are additionally linked to RxNorm. Visit http://www.nlm.nih.gov/research/umls/rxnorm/index.html for more information.
National Uniform Billing Committee (NUBC) Uniform Bill Version 1992 (UB-92)/Current UB Data Specifications Manual	A code set identifying status of patient discharge on an institutional claim (e.g., inpatient, outpatient, hospice, home care). Visit http://www.nubc.org/ for more information.
Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) Hospital AVailability Exchange (HAVE)	Specifies an XML-formatted document that allows healthcare provider organizations to communicate specific utilization information and status of a facility (e.g., hospital, trauma center, nursing home) and its resources; including bed capacity and availability, emergency department status, the available service coverage, and the status of a hospital's facility and operations. HAVE is initially intended for use in disaster or

Standard	Description
	emergency situations. Visit http://www.oasis-open.org/home/index.php for more information. Reasoning: The BIO TC has identified the Hospital Availability Exchange (HAVE) dataset as being closely aligned with the data elements identified by the Biosurveillance Data Steering Committee. The HAVE specification is being proposed as an Organization for the Advancement of Structure Information Standards (OASIS) standard, but has not yet been fully reviewed and adopted. HAVE was derived from the results of the HAVBed project sponsored by the Agency for Health Resources and Quality. While it is anticipated that the HAVE specification will soon be approved by Oasis, and is likely to meet the requirements for reporting the data elements for hospitals and health resource availability identified by the BDSG, pending this formal approval the choice of a specific standard to represent these data elements remains a gap as defined in the HITSP policies. HAVE specification contains terminology specific to utilization information and allows communication of the status of a hospital and its resources to other emergency agencies, including bed capacity and availability, emergency department status, the available service coverage, and the status of a hospital's facility and operations. Qualifier: The needs of biosurveillance would be better suited if this terminology were instantiated as a coded vocabulary
Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) Distribution Element (DE)	Describes a standard message distribution framework for data sharing among emergency information systems using the XML-based EDXL. This format may be used over any data transmission system. DE is initially intended for use in disaster or emergency situations. Visit www.oasis-open.org for more information. Reasoning: The Emergency Data Exchange Language (EDXL) is a suite of specific XML based standards intended as a suite of emergency data message types including resource queries and requests, situation status, message routing instructions and the like, needed in the context of cross-disciplinary, cross-jurisdictional communications related to emergency response. It is the result of a project of the Disaster Management eGov Initiative of the Department of Homeland Security (DHS) as a means to enhance XML based inter-agency emergency data communications. DHS partnered with industry members of the Emergency Interoperability Consortium (EIC) to bring the work to OASIS for advancement and standardization.
Unified Code for Units of Measure (UCUM)	A code system intended to include all units of measures being contemporarily used in international science, engineering, and business. The purpose is to facilitate unambiguous electronic communication of quantities together with their units. The focus is on electronic communication, as opposed to communication between humans. Visit http://aurora.regenstrief.org/UCUM/ for more information.

CONSUMER EMPOWERMENT LIST OF STANDARDS

Standard	Description
Accredited Standards Committee (ASC) X12 Insurance Subcommittee (X12N) Implementation Guides Version 004010 plus Addenda 004010A1	Detailed Implementation Guides keyed to release 004010 of the X12 standards. These Implementation Guides provide details on the use of X12 standards to accomplish specific transaction functions. Some of the version 004010 Implementation Guides, but not all, have been adopted as Implementation Specifications under HIPAA. Many of the version 004010 Implementation Guides, including all of those adopted under HIPAA, have Addenda that contain updates -- only -- to the original Implementation Guides. These Addenda are identified as version 004010A1. Implementation Guides 004010X092 and 004010X092A1 describe transactions for Eligibility Inquiry and Response. Implementation Guides are published by Washington Publishing Company. Visit www.x12.org for more information.
Accredited Standards Committee (ASC) X12 Standards Release 004010	Release (version) 004010 of the Accredited Standards Committee (ASC) X12 standards including the X12.5 Interchange Control, X12.6 Application Control Structure, 270 Eligibility, Coverage or Benefit Inquiry, 271 Eligibility, Coverage or Benefit Information and other control standards for the uniform electronic interchange of business transactions. Published by the Data Interchange Standards Association (DISA). Visit www.x12.org for more information.
American Society for Testing and Materials (ASTM) Standard Specification for Continuity of Care Record (CCR): # E2369-05	A core data set of the most relevant and timely facts about a patient's healthcare. It is to be prepared by a practitioner at the conclusion of a healthcare encounter in order to enable the next practitioner to readily access such information. It includes a summary of the patient's health status (e.g., problems, medications, allergies) and basic information about insurance, advance directives, care documentation, and care plan recommendations. An XML version of the CCR, known as the Continuity of Care Document (CCD), prepared by Health Level Seven (HL7) in collaboration with ASTM, also exists and described under Health Level Seven standards. Visit www.astm.org for more information.
Council for Affordable Quality Health Care (CAQH) Committee on Operating Rules for Information Exchange (CORE) Phase I Operating Rules	Provide agreed-upon business rules and guidelines for using and processing eligibility inquiry and response transactions between providers and health plans; in particular those that have been adopted under HIPAA. Visit www.caqh.org for more information.
Federal Medication Terminologies	A set of federal terminologies related to medications, including the Food and Drug Administration's names and codes for ingredients, manufactured dosage forms, drug products and medication packages, the National Library of Medicine's RxNORM for describing clinical drugs, and the Veterans Administration's National Drug File Reference Terminology (NDF-RT) for specific drug classifications. This leverages the controlled terminology from three medication models that are maintained by the federal government: National Drug File Reference Terminology (NDF-RT) - Veterans Health Administration Structured Product Labeling (SPL) - Food and Drug Administration RxNorm - National Library of Medicine

Standard	Description
Health Level Seven (HL7) Version 3.0 Continuity of Care Document (CCD)	The Continuity of Care Document (CCD) constrains the HL7 Clinical Document Architecture Release 2 (CDA R2) in accordance with requirements specified in American Society for Testing and Materials (ASTM) standard E 2369-05, "Standard Specification for Continuity of Care Record (CCR)." The resulting CCD specification is developed as a collaborative effort between ASTM and HL7, and is intended as an alternate implementation to the one specified in ASTM E2369-05 for those organizations preferring to use HL7 Clinical Document Architecture (CDA) to communicate this information. Visit www.hl7.org for more information.
Health Level Seven (HL7) Version 3.0 Clinical Document Architecture (CDA/CDA R2)	The HL7 Clinical Document Architecture is an XML-based document markup standard that specifies the structure and semantics of clinical documents for the purpose of exchange. CDA is one instantiation of HL7's Version 3.0 Reference Information Model (RIM) into a specific message format. Of particular focus for HITSP Interoperability Specifications are message formats for Laboratory Results and Continuity of Care (CCD) documents. Release 2 of the HL7 Clinical Document Architecture (CDA) is an extension to the original CDA document markup standard that specifies the structure and semantics of clinical documents for the purpose of exchange. CDA R2 includes a prose document in HTML, XML schemas, data dictionary, and sample CDA documents. CDA R2 further builds upon other HL7 standards beyond just the Version 3.0 Reference Information Model (RIM) and incorporates Version 3.0 Data Structures, Vocabulary, and the XML Implementation Technology Specifications for Data Types and Structures. Visit www.hl7.org for more information.
Health Level Seven (HL7) Version 2.5	The HL7 Version 2.5 Messaging Standard is an application protocol for electronic data exchange in healthcare. It and prior versions have widespread use in the U.S. and internationally. Both message formats and value sets / code tables (e.g., diagnosis type, gender, patient class) are contained in the standard. Of particular focus for HITSP Interoperability Specifications are message formats described in Chapters 2, 3, 5, and 7 including patient demographic (ADT) and lab result reporting. These are also used within composite standards from IHE for Patient Identifier Cross-Referencing and Feed (PIX), Patient Demographics Query (PDQ), and Acknowledgements. Visit www.hl7.org for more information.
Health Level Seven (HL7) EHR System Functional Model Draft Standard for Trial Use (DSTU)	The HL7 EHR System Functional Model and Standard documents key functions of Electronic Health Record Systems (EHR-S) to enable consistent expression of system functionality. The functions are organized in two ways: as a hierarchy within the broad headings of care delivery and infrastructure functions; and as a list of functions that are deemed essential or desirable within four common care settings. Visit www.hl7.org for more information.
Integrating the Healthcare Enterprise (IHE) Laboratory Technical Framework Supplement 2006-2007 Revision 1.0	The IHE Laboratory Technical Framework introduces a content Integration Profile Sharing Laboratory Reports (XD*-LAB) that describes a clinical laboratory report as a human-readable electronic document. This document, which may also contain data in a machine-readable format and contains the complete set of final results produced by a clinical laboratory in fulfillment of one or more test orders for a patient. This document is focused on the sharing of sets of laboratory results in the form of a laboratory report structured document, and is not intended to address ordering or return of laboratory results to the ordering provider. Visit www.ihe.net for more information.
Integrating the Healthcare Enterprise (IHE) Patient Care Coordination (PCC) Technical Framework Revision 1.0	The IHE Patient Care Coordination Technical Framework (PCC TF) defines specific implementations (called Integration Profiles) of established standards to deal with integration issues that cross providers, patient problems or time. The Exchange of Personal Health Record Content (XPHR) Integration Profile describes the content and format of summary information extracted from a PHR system for import into an EHR system, and vice versa. The purpose of this Integration Profile is to support interoperability between PHR systems used by patients and EHR systems used by healthcare providers. The Cross Enterprise Document Sharing of Medical Summaries (XDS-MS) Integration Profile enables sharing of health information between enterprises of a regional health network. In the registry, healthcare providers publish pointers to documents stored in distributed repositories. Other healthcare providers may search and retrieve these and other documents. Visit www.ihe.net for more information.

Standard	Description
Logical Observation Identifiers Names and Codes (LOINC®)	A database of universal identifiers for laboratory and other clinical observations. The laboratory portion of the LOINC database contains the usual categories of chemistry, hematology, serology, microbiology (including parasitology and virology), and toxicology; as well as categories for drugs and the cell counts typically reported on a complete blood count or a cerebrospinal fluid cell count. Antibiotic susceptibilities are a separate category. The clinical portion of the LOINC database includes entries for vital signs, hemodynamics, intake/output, EKG, obstetric ultrasound, cardiac echo, urologic imaging, gastroendoscopic procedures, pulmonary ventilator management, selected survey instruments, and other clinical observations. Visit www.loinc.org for more information.
National Council for Prescription Drug Programs (NCPDP) SCRIPT Standard Version 8.1	Provides for the real-time electronic transfer of prescription data between pharmacies and providers. Functions supported include communication of new prescriptions, prescription changes, refill requests, prescription fill status notifications, and prescription cancellations. Visit www.ncpdp.org for more information.