Health Level Seven (HL7) and the Quality Work Group of the NCVHS

Testimony to the Quality Working Group of the NCVHS

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Health Level Seven (HL7) Overview

- HL7 is an ANSI Standards Development Organization (SDO)
  - Consensus-based balloted-standards process in existence since 1987
  - Now publishes standards for messaging, vocabulary, Arden syntax, CDA, CCOW, the RIM
- Each of these undergoes continual refinement, improvement, and revision, culminating in regular, iterative re-balloting and republishing cycles
- Began as a messaging standard carrying various specific fields of demographic, clinical, and billing data
- Now carries a very wide variety of Clinical, Demographic, and Other data
  - Highly detailed to support Clinical Decision Making and the Clinical Process
  - Strong move away from text and towards machine-processable structured data using standard coded vocabularies and canonical forms

Currently VERY COMPREHENSIVE

- Current released ANSI standard is version 2.5 (version 2.6 is in ballot)
  - 286 different transactions defined, some containing nearly 1000 different data fields
  - 124 different message formats used in these transactions
  - 92 external standard vocabularies identified to be used in various places
  - Over 400 additional fields identified for local vocabularies (user defined codes)
- Revolutionary new model-based version is through ballot and about to be published – Version 3 (some components of this are complete, or in final ANSI 45-day review)
  - Currently being implemented in many places in the US and throughout the world
  - Built on the HL7 RIM (Reference Information Model), which is an international standard

Current HL7 Usage

- Nationally
  - Used in one form or another by over 96% of inpatient Hospitals in the US
  - Part of the anticipated HIPAA requirements for Claims Attachments
  - Used widely in Public Health, and by virtually all vendors of clinical systems for Hospitals
- Worldwide
  - UK: NHS initiative to connect the clinical records of all hospitals and all physicians' offices using HL7 Version 3 in the next few years
  - Canada: Two nation-wide HL7 Version 3 initiatives
    - InfoWay: accelerate development of interoperable electronic health records
    - National eClaims: all claims/reimbursement transactions with fully machine-processable clinical documentation support
  - Australia national objective to implement all clinical transactions using HL7
  - Japan, The Netherlands, Finland, and Germany all engaged in national initiatives and projects to implement HL7 for moving clinical information
  - Under development in more than 20 additional countries
- Emerging
  - The CDC is basing all new types of surveillance messages on the HL7 Version 3 standard, and is updating its guides for the Version 2 ELR standard
  - Many participants in the HIMSS/IHE demonstrations at HIMSS 2003 & 2004
    - Over two dozen major Vendors building HL7 Version 3 capability (24 in '04 demo alone)
    - Almost a dozen signed up for the 2005 HIMSS demo already
    - Also US Government agencies, both national and state (NIST, California DOH, etc)3

Each of the following slides is addressed to one of the 8 recommendations

R1: Laboratory Reporting

- Nearly all in-hospital labs currently use HL7 to report Lab results
- Virtually all hospital medical records systems accept HL7 input for lab data
- The CDC has published a detailed specification for Electronic Laboratory Reporting (ELR) and it is widely implemented for surveillance
  - Also used for some BioTerror applications
  - It is currently being updated to the latest HL7 Version
- Large national laboratories, such as LabCorp and Quest are in the process of implementing ELR for all their facilities
- Less variability in the ELR standard than many others
- Lab result data in HL7 messages is mostly coded data
  - intrinsically of a higher quality than less rigorous textual representation and transmission formats
- Most institutional provider billing systems (HIS) are currently able to receive HL7 transactions with Lab data to generate claims
- A very small number of commercial physician's office systems are able to receive these HL7 messages and make the result data available to the physician

R2: Vital Signs and Measurements

- HL7 tightly integrates LOINC and SNOMED to support this
  - LOINC codes to identify the sign or measurement
  - SNOMED codes where the measured or identified data is a structured code for a concept (rather than a numeric value)
  - Other codes from the Nursing vocabularies also supported
    - NIC, NOC, NANDA, HHCC, etc.
  - HL7 also uses structured codes in standard transactions for:
    - Units of Measure
    - Alerting codes
    - Medications
- Most institutions do not currently encode this data in spite of the fact that it would be extremely useful
  - Few commercial products that capture this type of data encode it using standard vocabularies
- Those systems that do capture standard coded vital signs and measurements almost always send it in an HL7 transaction with LOINC codes

R3: Flag Secondary Diagnoses

- In HL7 v2.5, a diagnosis may repeat with each instance having a ‘type’
- User specified ‘types’
  - Current types include ‘preliminary’, ‘final’, ‘admitting’, ‘discharge’
  - A type code can also signify ‘secondary, present at admission’
  - The use of such additional codes are not currently standardized, nor widely used
- Currently Exists in HL7
  - The HL7 standards specify the capability to transmit secondary diagnoses present on admission to facilitate gathering this data within a hospital or integrated healthcare delivery network
  - However, actual hospital claims are transmitted using a standard from another SDO, X12N transaction set 837
  - Some institutions use HL7 for this within their walls

R4: Principal Procedure Physician

- Each procedure in an HL7 detailed procedure transaction has:
  - a list of one or more surgeons
  - a list of one or more procedure practitioners
  - a list of anesthesiologists
  - a flag indicating if the procedure was:
    - an admitting procedure;
    - the primary procedure;
    - the rank of this procedure in the list of several secondary procedures
- These are part of the HL7 financial transactions, and differ in detail from the X12n 837 transaction set
- Operating room systems that use the procedure reporting of these HL7 transactions may already support this
  - But these fields are not always populated by the application systems
  - Many billing systems currently have difficulty accepting this detailed data from the Operating Room systems
  - Although the HL7 message formats support it, some systems may have to be modified in order to send or receive and use these specific data items

R5: Admission and Procedure Time Stamps

- All HL7 transactions that carry admissions data currently have date/time fields in the transactions
  - Field is optional, but the standard recommends it to be populated on all admission transactions
  - Most systems do populate these currently
- All HL7 transactions that carry procedure data currently have date/time fields in the transactions
  - Field is currently required in the HL7 transaction
- All the time stamps are in the standard HL7 timestamp format (machine-processable)
- The acceptance and processing of these transactions by billing systems that construct claims transactions is variable
  - Many billing systems may not extract all the details of the HL7 data to place into the claims transactions
  - Precise ‘home’ for all of this data is an 837 issue

R6: Align dates, procedures, and codes in billing transactions

- These transactions are constructed by Provider billing systems that generate Claims transactions from the input information (manual data entry and HL7 messages)
- All dates in HL7 transactions that carry procedure data are already associated with the specific procedure codes
  - These are required fields in each block of Procedure data in the HL7 transactions
  - Although the HL7 message formats support it, some systems may have to be modified in order to send or receive and align these specific date items

R7: Coding Functional Status

- Currently partially covered using existing structures and vocabularies
  - Most Functional Status concepts have a LOINC code
    - Some copyright issues with missing items (SF36 content)
  - Typically numeric or coded values to identify the observed status
- Very few commercial systems implement the capture of coded Functional Status
  - Even fewer of these use the standard LOINC codes
- If the economic or regulatory drivers exist to collect this data, HL7 and LOINC would be delighted to work with other SDOs to:
  - identify the full set of codes for these functions and status
  - work to enable this to be used uniformly across the country
  - promulgate these as part of the HL7 standards

R8: Reporting Functional Status

- This is an Observation on a Patient
- HL7 Observation Reporting transactions are designed to carry such data (ORU)
  - If it is coded using the typical standard CHI vocabularies (LOINC, SNOMED, etc.) no changes need be made to existing observation transaction definitions
  - These are identical in structure to laboratory results transactions
    - Need no special additional message construction or parsing software development
    - However, non-lab systems generally do not embody the capability of generating these ORU transactions (they are mostly used widely in laboratory systems)

Population Question: Race/Ethnicity

- All HL7 transactions that have the Patient data segment (PID) carry Race and Ethnicity codes
  - Most admission systems are designed to collect this data
  - They rarely actually capture it due to people issues surrounding the collection process
- ‘Race’ contains the OMB Race codes
- ‘Ethnic Group’ contains codes for ‘Hispanic/Latino’ and ‘Not Hispanic/Latino’ (asked for by HHS)
- Most vendor HIS products collect this on the UI, and most will accept and store this information when received from an ancillary in HL7 transactions
  - Placing this data (once it is already available to the HIS) in the claims transactions would be an 837 issue

Summary of Approaches to the Candidate Recommendations

- Most of the items identified in the recommendations are currently identified in the published HL7 standards
- Most of these transactions and codes are implemented to varying degrees in current commercial systems that support HL7
- In cases where this data exists, the billing systems rarely accept the HL7 data and process it to construct claims transactions
- HL7 transactions incorporating standard vocabularies already exist for the packaging and transmission of most of this data
  - The interests of the quality initiatives are aligned with other interests
  - If compatible coding and messaging standards are adopted to enable the collection and reporting of this data, these additional transactions may be sent at the same time
  - These transactions can be sent to State quality organizations rather than to the claims adjudication bodies
- Business or regulatory incentives need to be either identified or created to encourage this complex and potentially expensive work

Extending Claims Transactions: Is this a good approach?

- These recommendations imply modifying claims transactions and the systems that currently process them
  - These claims transactions are already very complex
  - Desired quality data is intended for use by a different stakeholder
  - Billing systems must be modified to collect the data and pass it on
  - Payer systems must be modified to either handle the data or ignore it
- A more direct model might be to define an auxiliary transaction specifically for quality data that could flow through EDI networks
  - Using a model similar to the one proposed for Claims Attachments: An X12n transaction containing an embedded HL7 transaction
- Some agencies could arrange to accept these transactions directly over the internet using facilities already developed and deployed
  - The CDC secure data networks, currently used for surveillance
  - Other means for secure transfer from other government agencies
- Benefits of this approach
  - Changes remain focused on the standards, systems, and communities whose focus is on clinical issues
  - No competition for agenda time and priorities with those who currently have their hands full maintaining the administrative transactions

Thank You!

Questions?

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