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)
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
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 admission 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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