HL7’s Version 2 standards and submission to immunization registries

Alean Kirnak
Cochair HL7 Public Health and Emergency Response Workgroup
American Immunization Registry Association
Software Partners LLC
Overview

- What is the vision for immunization registries in the healthcare environment?
- What are the Meaningful Use requirements for reporting to immunization registries?
- What does EHR certification mean to providers reporting to immunization registries?
- The role of HL7
What are immunization registries?

- Public health initiative to manage vaccine-preventable diseases
- Databases for public health analysis
- Provide complete immunization records at point of service
- “EHRs for immunizations” for some providers
Early Use of HL7 Version 2 (2.3.1)

- Connect with EHRs
- Receive records electronically from providers
- Provide immunization records to providers
- Provide decision support at point of service
- Health Information Exchange (HIE)-like
A parent is preparing to take his child to the doctor for a Well Child visit. She views the child’s current immunizations using a Personal Health Record (PHR).
Ideal World

The patient and the parent visit their doctor

- The provider’s EHR queries the immunization registry and retrieves the
  **same immunization records the parent saw**
- The provider reviews the immunizations and administers vaccines
- The provider records the new immunizations
- The EHR updates the immunization registry using **HL7 Version 2**
# Ideal World

- The child is now getting ready to enter school
- The parent uses his hand-held device to make sure the child is up-to-date on required vaccines
- One shot is missing

<table>
<thead>
<tr>
<th>Dose</th>
<th>Vaccine date.</th>
<th>Age for this dose of vaccine is 6 weeks minus 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ineffective dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactive dose</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2010 Health Level Seven © International. All Rights Reserved. HL7 and Health Level Seven are registered trademarks of Health Level Seven International. Reg. U.S. TM Office.
Ideal World

In a rush, the parent gets the missing vaccine at a different clinic

- The clinic EHR retrieves the child’s records from the registry
  - including the vaccines recorded by other providers
- ...reviews the child’s records
- ...administers vaccines
- ...records the new vaccine
- The EHR updates the immunization registry using **HL7 Version 2**
Predictions of a severe flu season prompt the child’s school to vaccinate for seasonal flu as well as H1N1

- The school nurse logs onto the registry
- ...views the child’s record
- ...administrates a combination H1N1 and seasonal flu vaccine, and...
- ...records the shot in the registry
Ideal World

Epidemiologist views population or individual immunization data to analyze pockets of under-immunization, adverse events, etc.
Potential Value

- Population health tool
- Research tool
- Provider-provider health information exchange
- Improving the doctor-patient relationship
Meaningful Use Reporting*

§170.302(k) Submission to immunization registries. Electronically record, modify, retrieve, and submit immunization information in accordance with:

(1) the standard (and applicable implementation specifications) specified in §170.205(e)(1) or §170.205(e)(2); and

(2) At a minimum, the version of the standard specified in §170.207(e).

* Health Information Technology: Initial Set of Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology Final Rule issued by the Department of Health and Human Services (HHS) on July 28, 2010
Interpretation

- **Use of HL7 V2**
  - 2.3.1 with implementation guide
  - 2.5.1 with implementation guide
- **Use of CVX Codes**
  - Like CPT codes
  - CDC maintains a mapping CVX ↔ CPT
- **“Menued” with other public health functions**
  - Some states considering making it required
EHR Side vs. Registry Side

- “We are primarily concerned with Certified EHR Technology’s ability to transmit the immunization information in a standardized format, and do not believe that it is necessary to specify a particular recipient in the certification criterion.”

- “…we have revised the certification criterion to replace the word “transmit” with “submit” to better align this certification criterion with the meaningful use objective and measure.”

Source: Section III.D of the preamble of the Health Information Technology: Initial Set of Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology, Final Rule
EHR Side

- Provider must purchase/have a Complete EHR or EHR Module certified for immunization registry reporting criteria
- To be certified, the EHR or Module must demonstrate ability to generate messages in HL7 V2
- Must actually report where possible
EHR Certification Requirements*

- Record: enter CVX-encoded immunization information into the EHR
- Retrieve: display the CVX-encoded immunization information that has been entered into the EHR
- Submit: electronically submit the CVX-encoded immunization information to an immunization registry in either HL7 2.3.1 or HL7 2.5.1

*Source: NIST
Data Elements to Record

- Demographic
- Immunization
Demographic Data Elements

- Patient ID Number
- Patient ID Number Type
- Family Name or Surname
- Given name
- Date of Birth
- Administrative Sex/Gender
- Race
- Ethnicity
- Patient address and phone data
  - Street Address
  - City
  - State
  - Zip Code
  - Country
  - Address Type
  - Home Telephone Number
Immunization Data Elements

- CVX Code
- Vaccine Name
- Date/Time Start of Vaccine Administration
- Administered Amount
- Administered Units
- Vaccine Lot Number
- Manufacturer Name
- Manufacturer Code
## CPT to CVX mapping*

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Short Description</th>
<th>CVX Code</th>
<th>comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>90733</td>
<td>meningococcal MPSV4</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>90734</td>
<td>meningococcal MCV4P</td>
<td>114</td>
<td>This CPT maps to 2 vaccines (MCV4P and MCV4O)</td>
</tr>
<tr>
<td>90734</td>
<td>Meningococcal MCV4O</td>
<td>136</td>
<td>This CPT maps to 2 vaccines (MCV4P and MCV4O)</td>
</tr>
</tbody>
</table>

## Immunization Registry Side

<table>
<thead>
<tr>
<th>Compliance Level</th>
<th>Number of Grantees Reporting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Compliance – Able to Send and Receive HL7 Messages</td>
<td>30 of 51 (59%)</td>
<td>18 grantees were eligible and applied to receive HITECH-ARRA 317 funding to enhance EHR-IIS interoperability</td>
</tr>
<tr>
<td>Partial Compliance – Able to Send or Receive HL7 Messages</td>
<td>4 of 51 (8%)</td>
<td>2 grantees were eligible and applied to receive HITECH-ARRA 317 funding to enhance EHR-IIS interoperability</td>
</tr>
<tr>
<td>No Compliance – Unable to Send or Receive HL7 Messages</td>
<td>17 of 51 (33%)</td>
<td>11 grantees were eligible and applied to receive HITECH-ARRA 317 funding to enhance EHR-IIS interoperability</td>
</tr>
</tbody>
</table>

Source: 2009 Immunization Information System Annual Report
Recovery Act Funding to Support Immunization Registry Grantees

- CDC is providing support for the immunization registry side of the HL7 connection
- ARRA-HITECH grants were awarded to 20 immunization registries to upgrade their HL7 capability
- Emphasizes use of the new Version 2.5.1 Implementation Guide
Recovery Act Funding to Support Immunization Registry Grantees

- ARRA-HITECH funds will establish an expert panel of registry and EHR vendors to:
  - Improve HL7 V2.5.1 technical assistance documentation
  - Identify best practices for local business rules
Back to the Big Picture

Meaningful Use Phases:

Phase I: Immunization Registry Reporting
Phase II: Retrieving from Immunization Registries
Phase III: Decision Support
A parent is preparing to take his child to the doctor for a Well Child visit. She views the child’s current immunizations using a Personal Health Record (PHR).
The patient and the parent visit their doctor.

- The provider’s EHR queries the immunization registry and retrieves the same immunization records the parent saw.
- The provider reviews the immunizations and administers vaccines.
- The provider records the new immunizations.
- The EHR updates the immunization registry using HL7 Version 2.
Retrieval, Decision Support

- The child is now getting ready to enter school
- The parent uses his hand-held device to make sure the child is up-to-date on required vaccines
- One shot is missing

<table>
<thead>
<tr>
<th>Dose</th>
<th>Effective Dose</th>
<th>Ineffective Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Age for this dose of vaccine is 6 weeks minus 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stating vaccine date.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ending vaccine date.</td>
</tr>
</tbody>
</table>
Retrieval, Decision Support, Submission

In a rush, the parent gets the missing vaccine at a different clinic

- The clinic EHR retrieves the child’s records from the registry
- ... including the vaccines recorded by other providers
- ...reviews the child’s records
- ...administers vaccines
- ...records the new vaccine
- The EHR updates the immunization registry using **HL7 Version 2**
Predictions of a severe flu season prompt the child’s school to vaccinate for seasonal flu as well as H1N1

- The school nurse logs onto the registry
- ...views the child’s record
- ...administers a combination H1N1 and seasonal flu vaccine, and...
- ...records the shot in the registry
Enhanced by Electronic Data Submission

Epidemiologist views population or individual immunization data to analyze pockets of under-immunization, adverse events, etc.
Conclusion

- Phase I Meaningful Use incentives using HL7 V2 will enhance registry public health usage.
- The Phase I-III vision includes broader Health Information Exchange functionality.
- The vision overlaps with other Meaningful Use objectives such as decision support and patient empowerment.
- Though Meaningful Use is fully realized for immunizations has yet to be fully fleshed out, it will no doubt use V2 and other HL7 standards.
Resources

- NIST test procedure for certification
  http://xw2k.nist.gov/healthcare/docs/170.302.k_Immunizations_v1.0.pdf
- CVX to CPT mapping
  http://www2a.cdc.gov/nip/IIS/IISStandards/vaccines.asp?rpt=cpt
- HL7 2.3.1 Implementation Guide
- HL7 2.5.1 Implementation Guide
§170.205 Content exchange standards

- (e) Electronic submission to immunization registries
§170.207 Vocabulary standards