Entering the Super Highway: The BCH Experience with the Electronic Immunization Record

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Presentation Objectives:

- Explain the basic elements of the Massachusetts Immunization Information System (MIIS) and how the program impacts patients and communities throughout Massachusetts.
- Explain the role of the MIIS in meeting meaningful use requirements.
- Describe the steps involved in meeting the IT requirements for joining the MIIS.
- Describe how clinicians gain access to the MIIS and how its use is applied in a variety of settings.
- List the steps to on-board clinical and administrative staff in adopting the MIIS.
What is the Massachusetts Immunization Information System (MIIS)?

The MIIS is a secure, confidential, and easy to use system designed to support a complete set of immunization-related functions.

- Provides quick access to patient immunization records at point of care.
- Makes immunization histories for children new to your practice readily available.
- Validates patient vaccine history and forecasts due dates for future vaccinations.
- Identifies unimmunized and underimmunized children.
- Prevents duplicate immunization.
- Enables to print forms for school and camp.
- Creates reminder and recall materials for your patients with due or overdue immunizations.

Source: *Introducing the Massachusetts Immunization Information System MIIS*
Accessed from the MIIS Resource Center: www.contactMIIS.info
It is the law...

M.G.L. c. 111, s.24M legislation passed in June of 2010:

• Mandatory reporting of all immunizations administered in the state
• Access given to:
  • Schools
  • Healthcare professionals/hospitals
  • Local Boards of Health
  • WIC
  • Other state agencies who administer immunizations.
• As hospitals we are mandated to report all vaccine information to the state and we are also mandated to inform all patients and their families that we are part of the system.
Meaningful Use:

• Incentive program from the Federal Government encouraging providers to adopt and use EHR technology.

• In order to receive EHR-MU incentives, providers and facilities have to meet specific criteria, which has been divided into three stages over several years.

• Meeting immunization-specific requirements for Stage 1 establishes that providers must test and establish a connection between the EHR to the Immunization Information System in the provider’s jurisdiction.

From: Meaningful Use Fact Sheet: Immunization Information Systems. Submission of electronic data to Immunization Registries of Immunization Information Systems
MIIS from the IT side:

- Background of our site and the history of immunizations documentation at Boston Children’s Hospital
- Specific requirements for the MIIS and how they affected our work on this project
- The challenges presented by the different systems we use to enter immunizations
- Major issues we came across and how we approached them including additional considerations we looked into to solve these

Ongoing items:

- Support tasks
- Troubleshooting
- New build
Product live since 2006

BCH home grown immunization documentation system was functional until beginning of March 2012

On March 2012 we went LIVE with *new* Immunization Schedule

Uploaded all immunization data from legacy system
Defining the requirements for using MIIS

- Identify expectations of data process and how the exchange functions.
- Understanding how our users would be using the system and how it fit into their workflow.
- Outlined the elements for the historical data. This was not part of the real time interface.
- Setup 2 parallel projects to handle real time feed and the historical data flat file.
Challenges:

- Trying to put square pegs into rounds holes!!
- Mapping various code set and data elements.
- Conducting vaccine mapping.
- Identifying facility a vaccine was administered.
- Mapping data from different sources or legacy systems.
Mapping/aliasing data elements and codes sets.

- Understanding the requirement.
- Know the rules for the data elements.
- We used scripting to meet certain requirements.
- Mapping data which normally is an easy task took 5x longer to get it working with this exchange.

Examples for data element and code sets:

**State**

9.4 **Race: PID-10 (HL7 Table 0005)**

PID-10 is a CE data type; a triplet of values should be used, if an and description (PID-10.2) should be used.

<table>
<thead>
<tr>
<th>VALUE (PID-10.1)</th>
<th>DESCRIPTION (PID-10.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1002-5</td>
<td>American Indian or Alaska Native</td>
</tr>
<tr>
<td>2028-9</td>
<td>Asian</td>
</tr>
<tr>
<td>2076-8</td>
<td>Native Hawaiian or Other Pacific Islander</td>
</tr>
<tr>
<td>2054-5</td>
<td>Black or African-American</td>
</tr>
<tr>
<td>2106-3</td>
<td>White</td>
</tr>
<tr>
<td>2131-1</td>
<td>Other Race</td>
</tr>
<tr>
<td>&lt;empty field&gt;</td>
<td>Unknown/undetermined</td>
</tr>
</tbody>
</table>

Our code set -race:

<table>
<thead>
<tr>
<th>Code Set</th>
<th>Display</th>
<th>Display Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>BLACK</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>WHITE</td>
<td></td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>ASIANORPACIFICISLANDER</td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>AMERICANINDIANORALASKANATIVE</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>ASIAN</td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td>BLACKORAFCIANAMERICAN</td>
<td></td>
</tr>
<tr>
<td>Declined to Answer</td>
<td>DECLINERENTOANSWER</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>HISPANICORLATINO</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>OTHER</td>
<td></td>
</tr>
<tr>
<td>Unable to Answer</td>
<td>UNABLETOANSWER</td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian or Other Pacific Islander</td>
<td>NATIVEHAWAIIANDROTHIPACIFIC</td>
<td></td>
</tr>
<tr>
<td>Question Not Asked</td>
<td>QUESTIONNOTASKED</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>UNKNOWN</td>
<td></td>
</tr>
<tr>
<td>Biracial</td>
<td>BIRACIAL</td>
<td></td>
</tr>
<tr>
<td>&lt;empty field&gt;</td>
<td>Unknown/undetermined</td>
<td></td>
</tr>
</tbody>
</table>
Vaccine Mapping: Our build vs. MIIS expectations

- This was the most challenging piece of the project and consumed a very large piece of project time.

- The state wanted more than an “HPV” or “Influenza vaccine” documentation when administered. They wanted to have more specific information about that vaccine, which we did not have. We had significant challenges defining this piece.

- We setup a work group to help with these problems. The group consisted of myself, pharmacy, IT rep (who was also a pharmacist), pharmacy manager, MIIS consultant and MIIS Pharmacy contact.

- Example of vaccine mapping document next slide.
<table>
<thead>
<tr>
<th></th>
<th>Immunizations in CHB</th>
<th>Code From MIIS Sheet</th>
<th>Vaccine name in MIIS sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Fluzone PF SYR 0.25 mL</td>
<td>140</td>
<td>Flu-TIV 6-35 mos - preservative free</td>
</tr>
<tr>
<td>18</td>
<td>Fluzone vaccine</td>
<td>141</td>
<td>Flu-TIV &gt;= 3 yrs</td>
</tr>
<tr>
<td>19</td>
<td>haemophilus b conjugate (HboC) vaccine</td>
<td>47</td>
<td>Hib-HboC</td>
</tr>
<tr>
<td>20</td>
<td>haemophilus b conjugate (PRP-OMP) vaccine</td>
<td>49</td>
<td>Hib-OMP</td>
</tr>
<tr>
<td>21</td>
<td>haemophilus b conjugate (PRP-T) vaccine</td>
<td>48</td>
<td>Hib-PRP-T</td>
</tr>
<tr>
<td>22</td>
<td>haemophilus b conjugate vaccine</td>
<td>17</td>
<td>Hib-unspecified formulation</td>
</tr>
<tr>
<td>23</td>
<td>haemophilus b-hepatitis B vaccine</td>
<td>51</td>
<td>HepB-Hib</td>
</tr>
<tr>
<td>24</td>
<td>hepatitis A adult vaccine</td>
<td>52</td>
<td>HepA-Adult</td>
</tr>
<tr>
<td>25</td>
<td>hepatitis A pediatric vaccine</td>
<td>83</td>
<td>HepA-Peds 2 Dose</td>
</tr>
<tr>
<td>26</td>
<td>hepatitis A vaccine</td>
<td>85</td>
<td>HepA, unspecified formulation</td>
</tr>
<tr>
<td>27</td>
<td>hepatitis A-hepatitis B vaccine</td>
<td>104</td>
<td>HepA-HepB Adult</td>
</tr>
<tr>
<td>28</td>
<td>hepatitis B adult vaccine</td>
<td>43</td>
<td>HepB Adult</td>
</tr>
<tr>
<td>29</td>
<td>hepatitis B immune globulin</td>
<td>not in MIIS</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>hepatitis B pediatric vaccine</td>
<td>8</td>
<td>HepB-Peds</td>
</tr>
<tr>
<td>31</td>
<td>hepatitis B vaccine</td>
<td>45</td>
<td>HepB, unspecified formulation</td>
</tr>
<tr>
<td>32</td>
<td>human papillomavirus vaccine</td>
<td>62</td>
<td>HPV, quadrivalent</td>
</tr>
<tr>
<td>33</td>
<td>human papillomavirus vaccine (PF)</td>
<td>not in MIIS</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>influenza A/H1N1 vaccine, inactivated</td>
<td>127</td>
<td>FLU-H1N1 &gt;=3 yrs AND Flu-H1N1 6-35 mos</td>
</tr>
<tr>
<td>35</td>
<td>influenza A/H1N1 vaccine, live</td>
<td>125</td>
<td>Flu-H1N1-LAIV</td>
</tr>
<tr>
<td>36</td>
<td>influenza vaccine-md</td>
<td>cannot determine</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>influenza virus vaccine</td>
<td>cannot determine</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>influenza virus vaccine H1N1 inactivated</td>
<td>127</td>
<td>Flu-H1N1 &gt;=3 yrs AND Flu-H1N1 6-35 mos</td>
</tr>
<tr>
<td>39</td>
<td>influenza virus vaccine, H1N1, live</td>
<td>125</td>
<td>Flu-H1N1-LAIV</td>
</tr>
<tr>
<td>40</td>
<td>influenza virus vaccine, inactivated</td>
<td>141AND 140</td>
<td>Flu-TIV &gt;= 3 yrs AND Flu-TIV 6-35 mos - preservative-free</td>
</tr>
<tr>
<td>41</td>
<td>influenza virus vaccine, live, trivalent</td>
<td>111</td>
<td>Flu-LAIV</td>
</tr>
<tr>
<td>42</td>
<td>Japanese encephalitis vaccine SA14-14-2</td>
<td>39</td>
<td>Japanese encephalitis - SC</td>
</tr>
<tr>
<td>43</td>
<td>Japanese encephalitis virus vaccine</td>
<td>39</td>
<td>Japanese encephalitis - SC</td>
</tr>
<tr>
<td>44</td>
<td>Japanese encephalitis, unspecified</td>
<td>129</td>
<td>Japanese encephalitis, unspecified formulation</td>
</tr>
<tr>
<td>45</td>
<td>measles/mump/rubella/varicella vir vaccin</td>
<td>94</td>
<td>MMRV</td>
</tr>
<tr>
<td>46</td>
<td>measles virus vaccine</td>
<td>not in MIIS</td>
<td></td>
</tr>
</tbody>
</table>

Example of an early attempt at us matching our vaccines to MIIS.
Historical Flat File: Immunization Data from different sources

- Data from our old system was not entered with the requirements and standards.
- Data was missing elements (lot number, administration site).
- Formatting in fields was being used for other reasons.
- We set up a grid to track the different scenarios and worked with our MIIS contact and went through the different options for each scenario.
- We scripted in data to fill out the missing requirements.
- What worked well:
  - Pulled examples of the different data types.
  - Ran batch tests to ensure data processes.
  - Creating a grid and workgroup to help outline solutions
  - Got to know the data
PIN assignments from MIIS:

- It is important to identify the facility where the patient was seen.
- We have patients that are seen at Boston Children’s main campus, Dana Faber Cancer Institute and Martha Eliot Health Center.
- State requires a PIN (unique identifier) for each facility where a patient gets their immunization. This PIN needs to be part of the immunization message to MIIS.
- We created a tag for the different encounters to determine where the patient was treated. Based on that tag we would attach the PIN to the interface message.
We’re ‘live’ but the work doesn’t stop!

- Downtime planning for your site and state registry.
- Error reporting: Who gets notified of errors?
- Managing changes to the registry
  - How does the registry notify your site of changes?
  - How do you get notified of downtimes to the registry?
  - What are the expectations for vaccine changes?
  - What is the expected turn-around time to implement changes?
What are the logistical pieces for the clinical side?
First things first...

• We must report to families:
  – We are part of the MIIS.
  – By law we have to report ALL vaccines to the state, regardless of where the patient lives.
  – Families have the right to object sharing information with providers outside of BCH and the MIIS.
We need information sheets and posters in all languages
The Objection Form

1. Fill out the form and obtain parental/guardian signature.
2. Fax to the state and get confirmation sheet.
3. Barcode label and scan into patient’s chart with confirmation sheet.
E-Library Management

Massachusetts Immunization Information System (MIIS) > Reader View

The Massachusetts Department of Public Health Immunization Program is committed to promoting the health of Massachusetts' citizens by reducing the burden of vaccine preventable diseases that affect the residents of the Commonwealth. As part of this effort, the Immunization Program is preparing to launch a statewide web-based immunization registry in 2011. Once fully implemented, the registry, known as the Massachusetts Immunization Information System (MIIS), will be the official source of immunization information for Massachusetts.

Sheet Name: Fact Sheet for Patients and Parents (9)
- Fact Sheet for Parents and Patients
- Fact Sheet for Parents and Patients (Arabic)
- Fact Sheet for Parents and Patients (Chinese)
- Fact Sheet for Parents and Patients (Haitian Creole)
- Fact Sheet for Parents and Patients (Korean)
- Fact Sheet for Parents and Patients (Portuguese)
- Fact Sheet for Parents and Patients (Russian)
- Fact Sheet for Parents and Patients (Spanish)
- Fact Sheet for Parents and Patients (Vietnamese)

Sheet Name: MIIS Immunization Record Request Form (1)
- MIIS Immunization Record Request Form

Sheet Name: MIIS Poster (1)

Sheet Name: Sharing Your Immunization Information Objection (or Withdrawal of Objection) Form (2)
On-Boarding of Staff

• Announcements through all councils for medical and nursing staff.
  – Informatics
  – Nursing Education Council
  – Nursing Informatics Council
  – Prescriber Training
  – Executive Leadership
  – Nursing Leadership

• Announcements for the Practice Administrators for all settings.

• Frequent e-mail communication.
Critical pieces for education of staff:

• Send e-mails notifying the staff we will implement soon and attend staff meetings to demonstrate.

• After e-mails and meetings, it is of the essence to meet the staff in person and help them go through the enrollment process.

• Follow-up with visits to ensure that after they register they can log-in to the MIIS to enter the system and search patients correctly.

• Be present to troubleshoot problems and contact the state with issues.

• Practice makes perfect.
Clinician Access to the MIIS

- Staff can enter the system to look up patient information and generate reports of vaccine history.
- We do not use it to enter any data at this point, only to look it up.
- We do not use it to order vaccinations.
Going live Issues: Before and After

• Multiple data checks over a period of time to ensure data was transmitting correctly.

• We survived one upgrade before going live.

• One common issue was finding the e-mail address in the street address bar.

• Multiple vaccines combo shots were not transmitting correctly. We are still troubleshooting that problem.

• Staff needed reinforcement on how to complete and submit the objection form to the state and save in our records.
Recommendations for your implementation:

• Have your IT team communicate frequently with clinical team to ensure everyone knows the same information at the same time.

• Establish leadership roles for both teams and their implementation plans. Team leaders should also communicate regularly.

• Clinical implementation team leader should communicate weekly with the state officials and reps to ensure meeting the deadlines and troubleshoot issues.

• Communicate in every forum, become an ambassador of your project by making yourself available to everyone involved.

• The project does not end at “go live”, it continues until it becomes second nature to the system.
Any Questions?