PAST PRESENT FUTURE

Health Information Technologies in the Texas Newborn Screening Laboratory

Brendan Reilly
Program Specialist
2015 Specimen and Submitter Volume

- 790,000 Specimens
  - 404,000 Valid 1st screens
  - 379,000 Valid 2nd screens
  - 7,000 Unsats

- > 2100 Submitters
  - 300 Hospitals
    - 60% of specimens
      - (100 to 12,000 specimens per year)
  - 50 Birthing Centers
  - 100 Independent Midwives
  - 1,650 Pediatric Clinics
Order / Demographic Receipt

Healthcare Provider - Multiple Internal Systems

Provider HL7 Engine → DSHS HL7 Engine (Natus) → HL7 Backend Database

Healthcare Provider - Multiple Internal Systems

NBS LIMS (PerkinElmer)

Web Application (Natus)

LIMS Holding Table

Information imported when kit scanned by demo entry
Result Reporting

Daily data transfer to identify specimens with results

NBS LIMS (PerkinElmer) → Result Report Images

Qualitative result information extracted from result images

Result Report Images → HL7 Back End Database (Natus)

Result message created

HL7 Back End Database (Natus) → Provider HL7 Engine

Web Application (Natus) → Provider HL7 Engine

Provider HL7 Engine → Healthcare Provider

NBS LIMS (PerkinElmer) → Daily data transfer to identify specimens with results

Qualitative result information extracted from result images

Result message created
**CURRENT STATUS - OVERALL**

**Test Ordering**
- DSHS Entered
- Web Order
- HL7 - Web Combo
- Full HL7

~105,000 per year (13.5% of NBS)
Remote Ordering

**Reporting**
- Mailed
- Faxed
- Web Only
- HL7 Only

~95,000 per year (~12.6% of NBS)
Electronic Reporting Only
Current Status – Web Application

Order Entry (3.3%)

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Pediatrician / Clinic</th>
<th>Midwife / Birthing Center</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>9</td>
<td>2</td>
<td>24</td>
</tr>
</tbody>
</table>

Results Access

- All NBS results available
- ~1800 Facilities with accounts
- ~225,000 views / year
Web Application – Challenges

- Limited funding / staffing to:
  - Promote use
  - Training
  - Set up / Support

- Order entry requires purchase and configuration of label printer.

- Providers still need to enter data (diminishing time savings).

- DOC required to print label and submit order.

- Security requirements limit ease of access to reports.
WEB APPLICATION – NewSteps 360 Grant

- Fund travel to submitter facilities
  - Assist with set up
  - Train on use and process integration
- Provide label printers to promote order entry
- Investigate removal of DOC requirement
- Focus on sites where other HITs may not be appropriate or desired (cost)
Current Status – HL7

**NBS LIMS**

**HL7 Engine**

**Texas Health Resources**
- 14 Facilities
- 40,000 specs / yr

**Parkland**
- 13 Facilities
- 20,000 specs / yr

**Christus**
- 13 Facilities
- 17,500 specs / yr

**ADT / Web**
- 1 Facility
- 2,500 specs / yr
HL7 – Challenges

- **Staffing**
  - Same resources for different projects
  - Current Message developed before PHII Guide
    - No LOINC codes
    - Custom built for our current system
    - Limits flexibility of NBS program

- Competing Projects
- Complexity of Result Validations
- Integrating into overall lab and agency HIT systems
- Coordinating expansion – Meeting Lab and Submitter Needs
HL7 – Challenges

☐ Staffing
  - Same resources for different projects

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☐ Competing Projects

☐ Complexity of Result Validations

☐ Integrating into overall lab and agency HIT systems

☐ Coordinating expansion – Meeting Lab and Submitter Needs
HL7 – Challenges

- Staffing
- Pre – Implementation Guide Message
- **Competing Projects**
- Complexity of Result Validations
- Integrating into overall lab and agency HIT systems
- Coordinating it all – Lab and Submitter Needs
COMPETING PROJECTS

- Project Rollout – Web App / Custom HL7 message developed
- HL7 Implementation 4 – 13 Facilities
- PHII and NLM release implementation guide for HL7 in NBS
- CF Expansion
- SCID Expansion
- HL7 Implementations 1&2 – 15 Facilities
- HL7 Implementation 3 – 13 Facilities
- Lab / Followup LIMS Upgrade
- Secondary Targets Expansion
MORE COMPETING PROJECTS

- Instrument Upgrades
- Workflow Redesign
- Data Management / Reporting LIMS Replacement
- Pompe
- MPS 1
- X-ALD

Timeline:
- 2016
- 2017
- 2018
- 2019

15 – 18 months
HL7 – Challenges

- Staffing
- Pre-Implementation Guide Message
- Competing Projects
- **Complexity of Result Validations**
- Integrating into overall lab and agency HIT systems
- Coordinating it all – Lab and Submitter Needs
Verification must be performed by reviewing the first downstream system (screenshots) in which the ordering clinician/client may be expected to routinely access patient data.

Where multiple sites use the same recipient system, validation need only occur at one of the sites.

Validation should include
- Abnormal flags
- Comments/footnotes
- Corrected Results
- Examples of individual results
Minimizing Result Validations

- What is sufficient # of examples?
- Do text only changes require testing?
- Minimum of:
  - ~100 for all possible results
  - ~20 for 1 example of each possible analyte and disorder
HL7 – Challenges

- Staffing
- Pre – Implementation Guide Message
- Competing Projects
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Integrating into Lab / Agency HIT

Healthcare Providers

NBS

Clinical Chemistry

Microbiology / Emergency Prep

Environmental

DSHS Childhood Lead Poisoning Prevention

CDC

ELEXNET

NEDDS

LRN

Texas Commission on Environmental Quality
Integrating into Lab / Agency HIT

- Laboratory
- TEHDJ
- CCHD
- Immunizations
- Vital Statistics
- Cancer Registry
- Birth Defects

Healthcare Providers
HL7 – Challenges

- Staffing
- Pre – Implementation Guide Message
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HL7 – Moving Forward

- New message
  NLM / PHII Implementation Guide
- Health Services Gateway
- NewSTEPS 360 grant
- Investigate
  - Simplified result options
  - Minimizing necessary result validations
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Healthcare Providers
Health Services Gateway

- Laboratory
- TEHDi
- CCHD
- Immunizations
- Vital Statistics
- Cancer Registry
- Birth Defects
- Healthcare Providers

Logos and institutions associated with the Health Services Gateway:
- CDC
- LRN
- eLEXNET
- Texas Commission on Environmental Quality
- Texas Department of State Health Services
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NewSTEPS 360 Grant

NBS LIMS (PerkinElmer) -> TEHDI

Label
Order Message

TEHDI System (OZ) -> Enhanced ADT

Healthcare Providers (~100 in Texas)
NewSTEPS 360 Grant

- **Provider Benefit**
  - Saves time in completing demographic forms
  - Leverages existing message
  - Includes data validations to improve data quality

- **DSHS Benefit**
  - Automates data entry – electronic order
  - Resolves issues with configuring to receive ADTs
  - Allows electronic order entry to move forward during data system transition

- Currently does not include result message
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  - Simplified result options
  - Minimizing necessary result validations
New message

NLM / PHII Implementation Guide

Health Services Gateway

NewSTEPs 360 grant - OZ

Investigate

- Simplified result options
- Minimizing necessary result validations
THANK YOU