Approach and Challenges to Implementing Electronic Data Transmission (EDT) for Newborn Screening in a State with Greater than 100 Birth Hospitals

Kathleen Fiato (1), Thomas Heckert (1), Lisa Hein (3), Tricy Thomas (2),   Beth Vogel (1), Christopher Johnson (1), Bryan LaPlante (1), Amanda Kufs (1), Mary Graziano (1), Marilyn Kacica (3), Joseph Orsini (1), Michele Caggana (1).

(1) New York State Department of Health, Newborn Screening Program
(2) Neometrics, a division of Natus Medical Incorporated
(3) New York State Department of Health, Division of Family Health

Wadsworth Center
NEW YORK STATE DEPARTMENT OF HEALTH

Objective

To share NYS experience during implementation of electronic data transmission (EDT)

EDT:

• Hospital demographic information transmitted electronically to Newborn Screening Program

• Screening results electronically transmitted back to hospitals (Optional via HL7 messaging).

Hospital

Lab: Data Entry

EDT
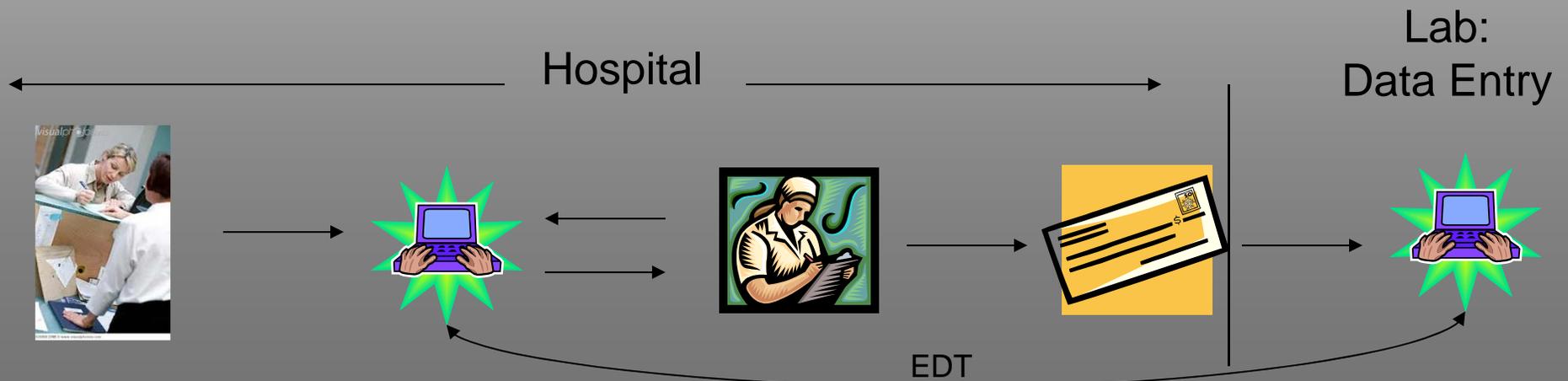
Background

- **New York State births/year: ~250,000**
- **140 hospitals throughout state**

Basic Terminology:

ADT = Admit Discharge Transfer: Contains patient demographic information from admissions/discharge/transfer information

ORM = Order message (contains ADT information and all other information on sample collection card)

ORU = Order Result Message (observation result): screen result going back to hospital

Team Approach

Hospital Staff

- Nursery
- Laboratory
- IT

Department of Health Staff

- Data Entry
- Accessioning
- Project management
- IT:
  - HL7 expertise
  - Data transfer expertise

Strong vendor support

Collection Form

Newborn's information

Mother's information

HOB and physician information

Notes:

- Data collected at various times

- Some information on card is not housed in hospital database

- Card used as a data collection device

- Information on card transcribed from various sources of data within hospital

- Spot for label

Why Implement EDT?

Demographic Data:

- Reduce transcription errors:
  - data in hospital database transcribed to card
  - data on card entered into NBS database
- Electronic tracking of samples submitted by hospital
- Initiate a NBS order by the hospital

Newborn Screening Data:

- Data relayed directly to hospital database
- Reduce paper
- Electronic medical records
- Data can be shared with other sources (PCP/Specialist)

Meaningful use!

NYS Approach

- Surveys sent to hospitals to determine HL7 readiness

- Large hospitals that were "HL7 ready" were approached

- Hospitals were provided with documentation describing three EDT options

EDT Options

1. "Fully Automatic" (ORM/ORU HL7)*

2. "Remote Demographic Entry" (RDE): a web-based data entry application developed by Neometrics

3. "Semi-automatic" (combination of ADT HL7 & web-based data entry via RDE)

*Note: Currently can only provide hospitals with screening results if option 1 is chosen

EDT Methods Overview

Hospital Ordering and Submitting NBS specimens	RDE	ADT	HL7
	Handwrite infant's last name on blood card – and data collected on card if card used as collection tool	Handwrite infant's last name on card	Handwrite infant's last name on card
	Hospitals staff enter all data into RDE web based form	Health Information System sends ADT file to DOH; pre-populates RDE form, hospital staff fills in "missing" data	Health Information System sends ADT and clinical data via ORM/HL7 message
	Affix RDE-generated label to blood card (optional)	Affix RDE-generated label to blood card	Affix hospital configured/generated label to form

Benefits

RDE	ADT	HL7
Simple, web accessed system	Limited manual data entry	Minimal or no data entry
Low tech solution for hospitals-limited IT resource usage	Less risk of data errors from user entry	Message standardization = lowest risk of ongoing errors
NBS Program changes to application and data collected on blood card are centrally managed by DOH vendor, requires no effort from hospitals	Data in hospital database does not have to be reentered by hospital staff	Most time savings for hospital users-automated processes
Easiest and fastest implementation	Moderate time saving for hospital staff	Screen data can be electronically transferred to hospital via ORU
Recommended for small hospitals.	Little additional programming involved	Recommended for large hospitals.

Limitations/Challenges

RDE	ADT	HL7
Label not very helpful – hospitals still use blood collection form to collect patient information	Little interest in this method	Requires full understanding of HL7 messaging
Data entry work shifted to hospital	Requires strong understanding of HL7 messaging	Not all required data is in hospital database, hospitals developed supplemental tool
Hospital staff must access web	Hospital staff must access web	Timing of EDT orders and error resolution
Difficult to implement in large hospitals; training	Difficult to implement in large hospitals; training	Transition from paper to electronic system
Hospital will not receive electronic NBS results	Hospital will not receive electronic NBS results	

Results

- Five hospitals are using ORM HL7 messaging (5.7% of specimens)
- Fifteen hospitals are transmitting data via RDE (11.3% of specimens)
- One hospital is implementing ADT HL7 <1%
- Two hospitals are consuming NBS results from ORU message
- Combined the NBS Program receive ~17-18% of specimen demographic information electronically

Lessons Learned (1)

Hospitals and the NBS Program were impacted

- Changes required in hospital and NBS workflow
- What is in it for hospitals/especially affected staff
- Challenging to keep hospital staff trained in data entry requirements
- Need more internal data checks built into hospital data entry screens
- Some NBS data elements were not in the hospital electronic medical record
- Hospital practices should change: collect data electronically at varied stations

Lessons Learned (2)

- Lack of staffing at hospitals and hospitals undergoing changes to databases were common issues
- Highly recommend a visit to each hospital to understand their workflow
- Separate EMRs (and different systems) for the mother and baby were commonly encountered
- NBS Program changes to blood collection card needs to be scheduled and permit backward capability
- Emphasis should be on quality not quantity, otherwise your data entry staff will be overwhelmed with errors
- Try to get buy in from Medical Record Providers –include data collection screens for use at multiple institutions

- Label must include information needed to process the sample (DOB, date sampled, birth weight, hospital): THINK COOP.

Conclusions

- Need strong IT support

- Significant challenges to program and hospitals
  - The inability to verify data creates a higher risk of errors; need to ensure the most important data is accurate

- The current implementation plan is undergoing assessment for improvements and the project is expected to net benefits for infants, hospitals and the Program

- Need to change mindset of hospital and NBS staff from paper based to electronic based data collection

Acknowledgments/Questions

- Funding: HRSA 09-242
- Pilot Hospitals
- Office of Health Information Technology Transformation
- Karolina Schabses (NYS-DOH, UPHN Program Manager)

HL7 Team: Kathleen Fiato, Thomas Heckert, Lisa Hein, Tricy Thomas, Christopher Johnson

RDE Team: Amanda Kufs, Bryan LaPlante, Mary Graziano

Thank You