Interactive Training Webinar for Newborn Screening Specimen Collection

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August 2014
- Survey was sent to all NBS submitters to highlight concerns with specimen collection process

September 2014
- Workgroup of DHS, NBS laboratory, Hospital representatives (5) met to review survey responses and identify/prioritize issues related to specimen collection

October 2014
- The same workgroup of DHS, NBS laboratory, and Hospital representatives (5) met to brainstorm/identify/prioritize way to improve specimen collection

Frequent issues identified by submitters
- Lack of a consistent site-specific process
- Lack of instructional materials
- Lack of training
- No visual inspection before shipping specimens
- Using capillary tubes
- Blood Clotting within circles on the specimen card
Unsatisfactory Specimen Collection

Percentage of Unsatisfactory Specimens:

- JAN: 2.77%
- FEB: 2.19%
- MAR: 2.32%
- APR: 2.13%
- MAY: 1.79%
- JUN: 1.62%
- JUL: 1.62%
- AUG: 1.94%
- SEP: 1.80%
- OCT: 2.04%
- NOV: 2.53%
- DEC: 1.89%

Average:
- 2013 = 2.6%
- 2014 = 2.0%
Reasons for Unsatisfactory Specimens

2014

- Blood Clots: 38.4%
- Blood on Tan Cover: 3.2%
- SMEared Or DISColored Blood: 3.4%
- Layered Specimen: 6.7%
- INcomplete Saturation: 11.8%
- Filter Paper Damaged (Capillary): 13.0%
- INcomplete Saturation (High Hematocrit): 16.6%
- Plasma Separated From RBCs: 2.8%
- Received >7 Days After Collection: 0.8%
Action Items

We were awarded federal funding through the Centers for Disease Control and Prevention to design a web-based training module for specimen collection.
Wisconsin Newborn Screening Program

www.slh.wisc.edu/moodle

Released in April 2015

Basics on newborn screening specimen collection and submission

Helping babies get started on the right foot
Learning Objectives

Illustrate proper blood specimen collection

Outline the precise steps to take after blood collection

In the event of an unsatisfactory specimen, explain the necessary steps for specimen recollection

Describe quality assurance activities a submitter must utilize to ensure the collection process is performed correctly and consistently on all babies
Webinar Format

The training covered in this webinar is specific to the process for blood collection and submission.

This webinar is approximately 60 minutes long and includes:
- Pre- and Post-tests
- Family Story
- Training module
- Webinar Evaluation
- Available for PACE credit
Newborn Screening Specimen Collection Workflow

Birth of Baby → Collect specimen 24-48 hours after birth → NBS Specimen Collection Materials
- Newborn screening card
- Powder-free gloves
- Alcohol wipes
- Lancet 1.6mm deep 2.5mm long
- Heal warming device
- Sterile gauze pad
Process
- Warm baby’s foot
- Clean puncture site with alcohol wipe
- Puncture medial or lateral plantar surface of foot
- Wipe away first drop of blood
- Fill all five circles on collection card

Wait 3 hours for specimen to dry

Review of Specimen Collection
Collect another specimen if there are...
- Blood clots
- Incomplete Saturation
- Multiple layers of dried blood
- Plasma separated from RBCs
- Contamination
- Damage to filter paper
- Blood on tan cover

Specimen Card
Include the following key information:
- Mother’s name
- Name of baby’s primary care physician
- Birth date and time
- Collection date and time
- Birth weight
- Gestational age

Specimen Recollection
- NBS Laboratory notifies submitter
- submitter is responsible for recollection
- Recollection should occur as soon as possible, no longer than 7 days after notification
Training
- Notify person who collected
  the unsatisfactory specimen
- Review reason(s) for rejection
- Offer training opportunities

Recollect specimen as soon as possible → Poor Specimen Identified

Ship to WSLH within 24 hours after collection

Package and Ship Specimen
- Replace cover slip over card
- Place card in shipping envelope
- Do not place in sealed container
- Never batch samples
- Never hold blood card for hearing or pulse oximetry data

WSLH NBS Laboratory
Unsatisfactory Specimen → Specimen accepted for testing → Specimen accessioning and evaluation

Arrive at WSLH within 3 days after collection

Quality Indicators to be Monitored
1. Specimen cards missing key information
2. Unsatisfactory specimen collection
3. Specimens collected within the recommended time frame (24-48 hours after birth)
4. Timing between specimen collection and receipt at the laboratory
# Unsatisfactory Specimen Identification Guide

## Newborn Screening

### Example of an Acceptable Specimen

### Unacceptable Specimen: Blood Clots

- **Can be avoided by:**
  - Rapidly applying the drop of blood onto the card
  - Never touching the same circle multiple times with blood

### Unacceptable Specimen: Layered Blood

- **Can be avoided by:**
  - Never touching the same circle multiple times with blood

### Unacceptable Specimen: Incomplete Saturation

- **Can be avoided by:**
  - Always examining both sides of the card
  - Making sure the blood soaks through the entire circle
  - Making sure the baby is well hydrated prior to specimen collection

### Unacceptable Specimen: Plasma Separated from RBCs

- **Can be avoided by:**
  - Rapidly applying the drop of blood onto the card
  - Making sure the puncture site is dry after wiping with alcohol
  - Not excessively squeezing the puncture site to obtain the blood
  - Not using a capillary tube

### Unacceptable Specimen: Contamination

- **Can be avoided by:**
  - Never allowing the filter paper to come in contact with uncleaned hands or substances such as alcohol, formula, antiseptic solution, water, lotion or powder either before or after collection

### Unacceptable Specimen: Filter Paper Damage

- **Can be avoided by:**
  - Never bending the filter paper card during collection
  - Never "coloring-in" or repeatedly "dabbing" the filter paper circle with a capillary tube

### Unacceptable Specimen: Blood on Tan Cover

- **Can be avoided by:**
  - Always inspecting card prior to shipment
  - Allowing sufficient drying time before packaging card for shipment
Demographic Information

Which of the following best describes your job/title?

- Phlebotomist: 180
- Nurse: 321
- Midwife: 5
- Laboratorian: 132
- Physician: 0
- Other: 38

N=676, 9 months after release
Demographic Information

What is your role in the NBS specimen collection process?

N=676, 9 months after release
Overall Quiz Results

P value <0.0001

The whiskers represent the min and max value scored by any one learner. The box represents the 25th and 75th percentile.

N=676, 9 months after release
Unsatisfactory Specimen Collection

April 20, 2015 distribution of webinar
August 15, 2015 distribution of posters

Average:
- 2013 = 2.6%
- 2014 = 2.0%
- 2015 = 1.6%
PACE Credit
continuing education

During the 9 month period from release of the webinar, 409 out of 676 total learners (60.5%) obtained PACE credit after viewing the webinar.
Evaluation

relevance of material

396 total respondents to survey
Evaluation

Delivery of Content

5. The slides and presentation were easy to read and understand

6. The pace of the presentation was adequate (not too fast or too slow, nor too much)

7. The amount of information covered in the webinar was adequate (not too much information, nor too little information)

8. The quiz questions adequately reflected the content of the webinar and were useful to solidifying key concepts

396 total respondents to survey
Evaluation

Do you intend to use this webinar for training?

- 82 (81%) Yes
- 8 (8%) No
- 11 (10%) NA

“This link has been forwarded to all laboratory staff involved with the collection process and will be the subject of discussion at the next laboratory staff meeting.”

- 58% are already using webinar for staff training
- 8% indicated that they will use it for yearly competency assessments

“This is the second facility I have worked in within the state of Wisconsin in 22 years. This is the first time I have actually been trained. Most information I learned by fellow workers training me but some information I was taught was incorrect. Thank you.”
Evaluation

Do you have any suggestions for future versions of this webinar?

- 46% Yes
- 46% No
- 8% NA

52% pace was too slow
21% would prefer video (not slides) of collection
14% would like to see other webinars
  - Specimen collection in premature infants
  - Hearing Screening
  - Heart Screening
7% requested more personal stories
Next Steps

- Consider creation of additional training webinars
  - Webinar on collection requirements for pre-mature, low birth weight, sick newborns
    - Release on March 1, 2016
  - Webinar on hearing screening
  - Webinar on heart screening

- Develop learning management system to house training webinars
  - Release on March 1st, 2016

www.slh.wisc.edu/moodle
Things I have come to learn...

There’s no such thing as perfect or complete...only continuous improvement.
Acknowledgements

- Lisa Burley, Burley Consulting
- Brain Ploeckelman, DoIT, UW-Madison
  - Jan Klawitter, WSLH
  - Dr. Mei Baker, WSLH
- Dr. Charles Brokopp, WSLH
Helping babies get started on the right foot
Timeline of Wisconsin’s Quality Improvement Projects

- Nov 2013: JS Watchdog
- Mar 2014: NewSTEPs
- Jul 2014: Received
- Aug 2014: Quality
- Sep 2014: 24-48 Hours
- Mar 2015: NewSTEPs
- Apr 2015: Wisconsin Newborn Screening Program
Wisconsin Quality Assurance: Monthly Submitter Report

- Specimens missing key information
- Unsatisfactory Specimens
- Timing of Specimen Collection
- Timing between specimen collection and receipt at the laboratory
Transit Time: Collection to Receipt

Average:
2013 (<=3d) = 87.1%
2013 (<=4d) = 96.9%

2014 (<=3d) = 97.0%
2014 (<=4d) = 99.5%
Specimen Collection (24-48 hours)

Average:
2013 (24-48h) = 83.2%
2014 (24-48h) = 89.0%
Newborn Screening Program in Wisconsin

Screening for Hearing loss

Screening for 44 different conditions through a dried blood spot

Screening for Critical Congenital Heart Disease
Importance of Timing:
The Thompson Family
Testing Baseline Knowledge
Quiz Question #1

Order the following list of events within the specimen collection process.

a. Elevated the baby’s heart above the legs and warm the foot with a heating device
b. Clean the selected puncture site with an alcohol wipe
c. Puncture the skin
d. Wipe away the first drop of blood
e. Gently allow droplet of blood to saturate the filter paper specimen
Quiz Question #2

Indicate the ideal location for puncture site on the baby’s foot:
Quiz Question #3

How large of an incision should the lancet make in on the heel of a full term infant?

a. 1.0 mm deep by 2.5 mm long
b. 0.85 mm deep by 1.75 mm long
c. 1.5 mm deep by 2.0 mm long
d. 2.5 mm deep by 2.5 mm long
e. None of the above
Which of the following pieces of information is NOT critical for reporting of the newborn screening results:

a. Birth weight  
b. Birth date and time  
c. Collection date and time  
d. NICU status  
e. Mother’s name  
f. Physicians name and contact information  
g. Gestational age
Quiz Question #5

Which of the pictures below represent the most common reason for unsatisfactory specimens?
Missing Key Information*

*birth weight, birth date and time, collection date and time, gestational age
Missing Key Information*

*birth weight, birth date and time, collection date and time, gestational age
Specimen Collection (24-48 hours)

Average:

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<th>Year</th>
<th>24-48h</th>
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<td>2013</td>
<td>83.2%</td>
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<tr>
<td>2014</td>
<td>89.0%</td>
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<td>2015</td>
<td>95.1%</td>
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% Initial Specimens Collected 24-48 h

- 2013 (24-48h) = 83.2%
- 2014 (24-48h) = 89.0%
- 2015 (24-48h) = 95.1%
Transit Time: Collection to Receipt

Within 3 days

% of Specimens Received

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<th>% of Specimens Received</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
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