# Screening for Critical Congenital Heart Disease in Newborns Using Pulse Oximetry – New Jersey's Experience

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#### Pulse Oximetry Screening Legislation

#### P.L. 2011, Chapter 74

"The Commissioner of Health and Senior Services shall require each birthing facility licensed by the Department of Health and Senior Services to perform a pulse oximetry screening, a minimum of 24 hours after birth, on every newborn in its care."

- -Signed June 2, 2011
- -Effective Date -August 31, 2011
- 90 days after enactment
- -Unfunded Mandate





#### Role of NJDHSS

- Mandated to screen, not how to screen
- Point of care test
  - Hospitals responsible for ensuring follow up, not NJDHSS
  - No active follow up as with biochemical NBS
- Divisional Responsibilities
  - Division of Licensing
    - Oversight of hospital compliance with legislation
  - Newborn Screening Program
    - Initial charge to develop Best Practices Guidelines
    - Expanded to support and guide implementation efforts to build an effective screening & surveillance program

# Pulse Oximetry Screening Implementation

- First steps:
  - NJDHSS convened Critical Congenital Heart Disease Screening Working Group

 Initial focus to develop and distribute recommended screening protocol



#### **Screening Algorithm for Critical Congenital Heart Disease**

Recommendations from the New Jersey Department of Health and Senior Services

All babies 24-48 hours of age or shortly before discharge if < 24 hours\*

Perform and document pulse oximetry in both RIGHT HAND and either FOOT.



Is Pulse Oximetry reading < 90% in either the HAND or FOOT?

#### **FAIL**

Do not rescreen.

#### FAIL

3 or less?

NO

Repeat the above pulse oximetry screening algorithm in one hour by obtaining new measurements from both right hand and either foot. If baby does not pass after a total of three screenings (initial screen and 2 repeat screens), notify responsible medical practitioner and follow recommendations in box below.

- Notify responsible medical practitioner of the failed screen and of need for further evaluation.
- Evaluate for other causes of low oxygen saturation (e.g., persistent pulmonary hypertension, pneumonia, infection, etc.).

95-100%?

NO

- In the absence of a clear cause of hypoxemia, obtain a diagnostic echocardiogram by an
  expert in the interpretation of infant echocardiograms and review the report prior to
  discharge home. This may require transfer to another institution or use of telemedicine.
- If saturation is < 90% in either the hand or foot, the baby should have immediate clinical assessment and immediate referral to pediatric cardiology. In this case, do not wait and rescreen.
- A pass on the screen does not exclude the existence of a cardiac disorder.
- If cardiac evaluation is otherwise indicated (e.g., clinical signs, prenatal diagnosis of critical congenital heart disease, dysmorphic features, etc.), proceed with cardiac evaluation even if baby receives a pass on the pulse oximetry screen.

- Optimal results are obtained by using a motion-tolerant pulse oximeter that reports functional oxygen saturation, has been validated in low perfusion conditions, has been cleared by the FDA for use in newborns, and has a 2% root-mean-square accuracy.
- · Document results in medical record.
- Screen in the right hand and one foot, either in parallel or direct sequence.
- Apply probe to lateral aspect of right hand and foot in areas that are clean and dry. The two sensors (light emitter and detector) should be placed directly opposite of each other.
- Administration of supplemental oxygen may alter the interpretation of the screening result. For infants requiring supplemental oxygen, delay this screening algorithm until infant is stable in room air. For infants being discharged home on supplemental oxygen, perform screen prior to discharge and review results with responsible medical practitioner.
- Symptomatic babies require clinical evaluation.
- This screening algorithm should not take the place of clinical judgment or customary clinical practice.
- \* Children in Special Care Nurseries (including Intermediate Care Nurseries, Neonatal Intensive Care Nurseries, etc.) should be screened at 24-48 hours of age or when medically appropriate after 24 hours of age. In all cases, screening should occur prior to discharge from the hospital.



### Education/Training

- Distributed Protocols
- Conducted 2 webinars
- Frequent communication with hospitals
- Intensive efforts being planned (pending resources)
  - Best Practices Guidelines
  - Development of parent education handout
  - Train the trainer model for nursing education
  - Standardized slide deck for physicians conferences at each hospital

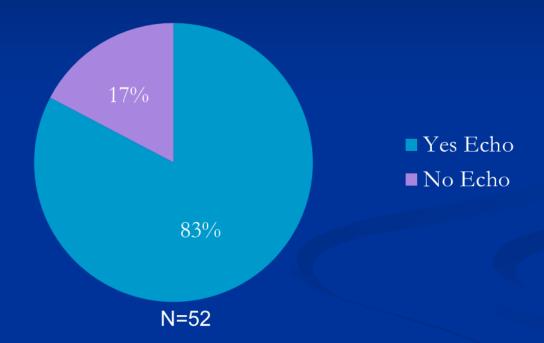
#### Surveillance

- Short Term Plan:
  - Quarterly aggregate data
    - # births
    - # screened
  - Birth Defects Registry —all failed screens
    - Screen results, results of evaluation, prenatal history, history of symptoms
- Long Term Plan
  - Electronic Birth Reporting System
    - Birth Defects Registry

#### What We Know...



# Hospital Survey- Echo Availability August, 4, 2011



Does your facility have the ability to do an echocardiogram on site (by someone with expertise in conducting echocardiograms in newborns)?



### Hospital Survey – Post Implementation November 2, 2011

- 25/52 hospitals responded
  - All utilizing NJDHSS protocol
  - Overall implementation was relatively smooth
    - Short implementation time
    - Cost
    - Documentation
    - Most stated no significant issues



#### PRELIMINARY DATA

#### <u>August 31, 2011 – November 30, 2011</u>

Number of live births	24,807
Number of infants screened	24,343
Percentage of infants screened	98.1%
Number of Failed Screens	9
Number of true cases	2



- Education
  - ■Need for more intensive training
  - Need for educational materi 1s
- Surveillance system
  - Accuracy of data—steep learning curve
  - ■Aggregate data
  - ■Quality assurance



### Strengths

- >95% of infants screened in first 90 days
- Mechanism to collect data for program evaluation
- Covered a lot of ground with very limited resources--both financial and staff
- Committed working group, dedicated staff and established connections with birthing facilities



"It is because of your law that our son's life was saved, and my husband and I are very grateful to you..."

Letter to Governor Christie from the family of Dylan Gordon







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