


Pulse Oximetry Newborn Screening



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Presenter

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Presentation Disclaimer

- Do not endorse a particular equipment manufacturer
- Pulse Oximetry Hospital Guidelines were developed with permission from Children’s National Medical Center

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Objectives

- Discuss the purpose of pulse oximetry (ox) screening in the newborn.
- Describe pulse ox equipment recommendations.
- Implement pulse ox training components.
- Identify steps for pulse ox screening.
- List steps for pulse ox reporting.

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Congenital Heart Defects (CHD) Data

- CHDs are the most common types of birth defects.
- CHDs affect nearly 1% (40,000) births each year in the United States.
- The most common type of heart defect is ventricular septal defect.
- 1 in 4 babies with a CHD have a critical CHD.

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CHD Prevalence

- The prevalence of some CHDs, especially mild types, is increasing, while the prevalence of other types has remained stable.
- The prevalence of all types of CHDs, including critical CHDs, varies by state and by type of defect.


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CHD-Related Deaths

- CHDs are a leading cause of birth defect associated infant illness and death.
- In a study of neonatal deaths, 4.2% of all neonatal deaths were due to a CHD.

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Hospital Guidelines



Alabama Department of Public Health

HOSPITAL GUIDELINES FOR IMPLEMENTING PULSE OXIMETRY SCREENING FOR CRITICAL CONGENITAL HEART DISEASE

ADPH

Obstetrical Services

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Purpose

- Pulse oximetry screening is used to detect Critical Congenital Heart Disease (CCHD) in infants before they leave the hospital or prior to the ductus arteriosus closure (2-3 days after birth) when heart defect complications can develop.

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Possible Physical Symptoms of Critical CHDs

- Problems breathing
- Pounding heart (heart murmur)
- Weak pulse
- Very pale or blue skin color
- Poor feeding
- Very sleepy

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CCHD

- Screening targets seven specific anomalies classified as CCHD:
 - Hypoplastic left heart syndrome
 - Pulmonary atresia (with intact septum)
 - Tetralogy of Fallot
 - Total anomalous pulmonary venous return
 - Transposition of the great arteries
 - Tricuspid atresia
 - Truncus arteriosus

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Equipment

- Each birthing facility is responsible for selecting pulse oximeter equipment for screening newborns.



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Equipment Requirements

- Equipment must be compliant with national standards and adhere to the following:
 - Motion-tolerant and report functional oxygen saturation
 - Validated in low-perfusion conditions
 - Cleared by the FDA for use in newborns
 - Calibrated regularly per manufacturer guidelines

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Training

- Training should be performed by qualified personnel.
- Training should be hands-on, and competency based.

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Training

- Training should include:
 - Overview of screening protocol
 - Education on use of equipment
 - Differences between adult and pediatric oximeter probes
 - Importance of adequate circulation
 - Effects of hypothermia and phototherapy
 - Facility resources for timely pediatric echocardiogram

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Training Tools

- Knowledge Assessment Quiz
- Competency Checklist

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Pulse Ox Probe Placement

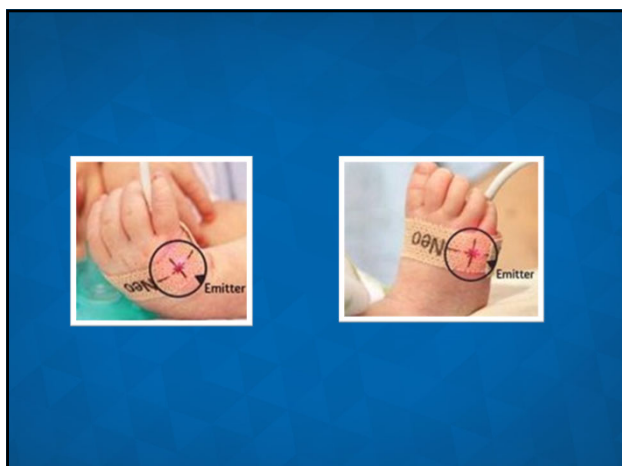
- Select probe placement on right hand and either foot.
- Place the photodetector portion of the probe on the fleshy portion of the infant's right hand and foot.
- Place the light emitter portion of the probe on the top of the right hand and foot.

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Pulse Ox Probe Placement

- The photodetector and emitter must be opposite each other in order to obtain an accurate reading.
- Secure the probe to the infant's right hand and either foot using the adhesive recommended by the manufacturer.

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Pulse Ox Probe Use

- Use a new, clean probe for each infant.
- Clean a reusable probe with recommended disinfectant solution.
- Be sure to use an infant probe.
- There should not be gaps between the sensor and infant's skin.

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Pulse Ox Screening

- Ensure that the infant is calm and warm during the screening.
- Swaddle the infant and encourage family involvement to promote comfort.
- Do not use an automatic blood pressure cuff when obtaining a pulse ox reading.

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Reminders

- Ensure that the infant is not placed in bright or infrared light while pulse ox is being performed.
- Do not use tape to apply the pulse ox probe to the infant's skin.
- Pulse ox readings are not instantaneous.

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Pulse Ox Screening Algorithm

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Reporting

- State law requires hospitals to report failed results to the Alabama Newborn Screening Program as soon as the screening is completed.

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Reporting Form

FAILED-SCREEN REPORTING FORM
 PLACE LABEL OR WRITE IN INFORMATION

Medical Record # _____
 Patient Name: Last _____ First _____
 Mother's Name: _____ Date of Birth: ____/____/____
 Hospital: _____ Medical Provider: _____

ALABAMA NEWBORN SCREENING PROGRAM
 For SSCP Screen to **334-256-3791**

Age at Initial Screening: _____ hours

Initial Screening
 Time: _____
 Pulse O₂ Saturation of Right Hand: _____
 Pulse O₂ Saturation of Foot: _____
 Difference (right hand - foot) _____ Fail

Second Screening (1 hour following initial screen if fail initial screen)
 Time: _____
 Pulse O₂ Saturation of Right Hand: _____
 Pulse O₂ Saturation of Foot: _____
 Difference (right hand - foot) _____ Fail

Third Screening (1 hour following second screening if fail second screen)
 Time: _____
 Pulse O₂ Saturation of Right Hand: _____
 Pulse O₂ Saturation of Foot: _____
 Difference (right hand - foot) _____ Fail

Other etiologies identified: Pulmonary Infection Urinary Other: _____
 Transferred: _____
 Provider referred to: _____
 Screened by: _____ Initial Last Name: _____ Date: ____/____/____

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Parental Education

- Establish a plan to educate parents prior to screening.
- A baby with a heart problem may have a normal pulse oximetry reading.
- Test is not painful and takes only a few minutes.

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Knowledge Assessment

- The following can affect the accuracy of the pulse oximetry reading:
 - A. Movement
 - B. Cold extremities or shivering
 - C. Crying
 - D. Bilirubin lamps and surgical lights
 - E. All the above

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Knowledge Assessment

- One clean, disposable pulse ox probe can be used on up to five patients.
 - A. True
 - B. False

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Knowledge Assessment

- All of the following can affect the accuracy of the pulse ox reading except:
 - A. Placing the probe on same extremity you are taking the blood pressure
 - B. Performing while the infant is crying
 - C. Using a clip on the finger of an infant
 - D. Infant skin color or jaundice

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Knowledge Assessment

- Pulse ox screening will detect all forms of congenital heart defects
 - A. True
 - B. False

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Knowledge Assessment

- The screening guidelines state that pulse ox screening should be performed on:
 - A. The right hand
 - B. One foot
 - C. Both a and b
 - D. Neither a or b

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Knowledge Assessment

- Pulse ox screening should be performed when the infant is what age?
 - A. Less than 8 hours
 - B. Between 8 hours and 18 hours
 - C. Greater than 24 hours
 - D. Less than 24 hours

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Knowledge Assessment

- If an infant fails the pulse ox screening, hospital staff should immediately:
 - A. Perform clinical evaluation
 - B. Immediate echocardiogram (may require transfer to NICU with cardiology services)
 - C. Referral for an outpatient echocardiogram
 - D. Both a and b

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Frequently Asked Questions

- What is pulse oximetry?
 - Simple test to measure oxygen
- How is pulse ox performed?
 - Sticky strip with a small red light is placed on hand and foot

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Frequently Asked Questions

- Why is pulse oximetry used?
 - It is an easy method to determine if an infant's heart and lungs are healthy
- When will the pulse ox be performed?
 - After the baby is 24 hours old

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Frequently Asked Questions

- What is a normal reading?
 - 95% or higher
 - Difference of 3 or less between the right hand and foot

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Questions?

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