

# Toolkit for Implementation of Pulse Oximetry Screening for Critical Congenital Heart Disease



## Table of Contents

About CCHD	
CCHD and pulse oximetry screening.....	3
CCHD Screening Protocol .....	4
Equipment needed for screening .....	8
Training Documents	
CCHD Screening In-Service Packet .....	9
CCHD Screening Algorithm .....	13
Knowledge Assessment.....	16
Resources for Providers and Parents .....	18
Critical Congenital Heart Disease (CCHD) Team .....	19
Screening Documents (printable)	
Competency Checklist.....	21
Training Log .....	22
Pulse Oximetry Screening Form.....	23
Refusal Form .....	24
Parent Education	
FAQs hand-out for positive screens.....	25

## About Critical Congenital Heart Disease (CCHD) & Pulse Oximetry Screening

**Congenital Heart Disease (CHD) is the most common birth defect.** Infants born with CHD have an abnormal heart structure which creates abnormal blood flow patterns. A group of heart defects that often cause life-threatening symptoms soon after birth are known as Critical Congenital Heart Disease (CCHD). Approximately 18 per 10,000 infants in the United States have CCHD. Infants diagnosed with CCHD will often require surgical interventions within the first year of life; however, CCHD is often treatable if detected early. The complications of CCHD can vary widely. In mild cases, the infant may not require surgery, but in severe cases, the infant may need multiple surgeries during their childhood.

A challenge of diagnosing CCHD is that some infants who have CCHD look and act healthy during the first few days of life. Physical examination alone can diagnose almost half of CCHD cases. Pulse oximetry screening also detects many cases of CCHD. A pulse oximetry screening includes performing pre-and post-ductal saturations (pulse ox of the right hand and either foot) on an infant after 24 hours of age. Not all infants who do not pass the pulse oximetry screening have CCHD; there are other reasons for decreased oxygen saturations such as pulmonary or vascular transitioning problems. It is also possible that a baby with CCHD can have a normal pulse oximetry reading, thus resulting in a false negative screening.

**The seven most frequently occurring CCHD conditions that pulse oximetry screening can identify are:**

- **hypoplastic left heart syndrome**
- **pulmonary atresia**
- **tetralogy of fallot**
- **total anomalous pulmonary venous return (TAPVR)**
- **transposition of the great arteries (TGA)**
- **tricuspid atresia**
- **truncus arteriosus**

Pulse oximetry screening for CCHD is recommended by the United States Department of Health and Human Services (HHS), the American Academy of Pediatrics (AAP), the American College of Cardiology Foundation (ACCF), and the American Heart Association (AHA).

## CCHD SCREENING PROTOCOL

### Critical Congenital Heart Disease (CCHD) Screening Protocol for Non-NICU Population

- Policy:** All newborns admitted to the newborn nursery will receive a screening for CCHD by trained RNs/CNAs prior to discharge.
- Purpose:** A safe, effective, and reliable method to detect cases of CCHD using pulse oximetry screening.
- Procedure:**
1. Upon admission to the maternity unit, the mother and/or family will receive information on CCHD screening from HEALTH's Newborn Screening Brochure.
  2. Infants will be screened after 24 hours of age or as close to discharge as possible for newborns who will be discharged early.
  3. Screenings should be completed when the infant is awake, quiet, and calm. If the infant is under phototherapy lights, he/she needs to be removed for the duration of the screening.
  4. Pre-ductal and post-ductal saturations will be taken on the right hand and on either foot. They can be conducted separately or simultaneously.
  5. To confirm an accurate reading, the pulse oximeter will be observed for a PI value (confidence index) that is equal to or above 1, or for color-coded equipment, green lights should be observed.
  6. The pulse oximetry screening algorithm will be posted to help interpret results.
  7. Pulse oximeter(s) will be stored in a designated area of the newborn nursery when not in use.
  8. Reusable pulse oximetry probes need to be properly disinfected after each use with an approved disinfectant, as instructed by the manufacturer.
  9. If a parent refuses a CCHD screening, ask them to speak with their pediatric provider. If they still refuse after receiving more information, the parents must complete HEALTH's refusal form.

**Result Interpretation:**

- ▶ **Pass:**
  - Pulse oximetry saturations are equal to, or greater than, 95% in either extremity with less than a 4% difference between the readings from the right hand and from the foot.
  
- ▶ **Fail (and corresponding action):**
  - Any pulse oximetry saturation level equal to or less than 89% in either extremity.
    - Contact newborn's provider immediately and transfer the infant to the NICU.
  - Three consecutive pulse oximetry saturation levels of 90%-94% in the right hand and in either foot or a 4% or more difference between the two readings.
    - Notify newborn's provider and contact a pediatric cardiologist for a consult and to perform an echocardiogram.

## Critical Congenital Heart Disease (CCHD) Screening Protocol for NICU Population

- Policy:** All newborns admitted to the Neonatal Intensive Care Unit (NICU) will receive a screening for CCHD by trained RNs or CNAs prior to discharge.
- Purpose:** A safe, effective, and reliable method to detect cases of CCHD using pulse oximetry screening.
- Procedure:**
1. During the infant's NICU stay, the mother and/or family will receive information regarding CCHD screening from HEALTH's Newborn Screening Brochure.
  2. Infants will be screened after 24 hours of age. Typically, the screening will be performed one or two days prior to the anticipated discharge date.
  3. For infants who are receiving oxygen, the screening should not be performed until the infant has been on room air only for at least 24 hours.
  4. Screenings should be completed when the infant is awake, quiet, and calm. If the infant is under phototherapy lights, he/she needs to be removed for the duration of the screening.
  5. Pre-ductal and post-ductal saturations will be taken on the right hand and on either foot. They can be conducted separately or simultaneously.
  6. To confirm an accurate reading, the pulse oximeter will be observed for a PI value (confidence index) that is equal to or above 1, or for color-coded equipment, green lights should be observed.
  7. The pulse oximetry screening algorithm will be posted to help interpret results.
  8. For patients who are being discharged on oxygen, an echocardiogram (ECHO) should be performed instead of the CCHD screening. If an ECHO has already been performed, during the infant's NICU stay, a CCHD screening does not need to be done. (On the CCHD screening form, check off "ECHO performed" in the "patient ineligible section".)
  9. For patients who were diagnosed with CHD Disease prenatally, a CCHD screening does not need to be completed. (On the CCHD screening form, check off "CCHD diagnosis" in the "patient ineligible section".)
  10. If a parent refuses a CCHD screening, ask them to speak with their pediatric provider. If they still refuse after receiving more information, the parents must complete HEALTH's refusal form.

### Result Interpretation:

▶ **Pass:** Pulse oximetry saturations are equal to or greater than 95% in either extremity with less than a 4% difference between the right hand and from the foot.

▶ **Fail (and corresponding action):**

- Any pulse oximetry saturation level equal to or less than 89% in either extremity.
  - Notify the newborn's pediatric provider, consult a pediatric cardiologist, and perform ECHO.
- Three consecutive pulse oximetry saturation levels of 90%-94% in the right hand and in either foot or a 4% or more difference between the two readings.
  - Notify the newborn's pediatric provider, consult a pediatric cardiologist, and perform an ECHO.

## Equipment needed for CCHD/Pulse Oximetry Screening

Each birthing facility in Rhode Island is responsible for selecting and purchasing pulse oximetry equipment for CCHD screening of its newborn population if the appropriate equipment is not already available. Equipment must comply with national standards and meet the following requirements:

- Approved by the FDA for use in newborns and neonates
- Validated for use in low-perfusion conditions
- Have a 2% root, mean-square accuracy
- Calibrated on a regular basis based on manufacturer's guidelines

Read FDA clearance for Pulse Oximeter use in Neonates:

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm>

### Supplies for CCHD screening:

- Pulse Oximeter
- Disposable or reusable probe(s)
- Disposable wraps (if utilizing reusable probes)
- Supply cart
- Disinfectant for equipment and reusable probes
- CCHD educational pamphlet for parent/guardian



# Critical Congenital Heart Disease (CCHD) Screening: In-Service Training Agenda

## Learning Objectives

Upon completion of the training, participants will be able to:

- Explain what CCHD screening is and why it is important.
- List CCHD screening protocols.
- Demonstrate the safe use of pulse oximetry equipment and the use of methods to obtain accurate readings.
- Understand HIPPA standards as they relate to CCHD screenings.
- Explain the CCHD screening algorithm.

## Background and Significance

- Congenital Heart Disease (CHD) is the most common birth defect. Infants born with CHD have an abnormal heart structure which creates abnormal blood flow patterns. A group of heart defects that have life-threatening symptoms are referred to as Critical Congenital Heart Disease (CCHD). Cases of CCHD often require surgical interventions within the first year of life.
- CCHD may go undiagnosed because:
  - Prenatal ultrasound identifies less than 50% of all CHD in utero.
  - Physical examination alone is only 50% accurate in diagnosing heart defects.
  - Many infants with CCHD look and act healthy.
- Research has shown that performing a pulse oximetry screening can detect many cases of CCHD. A pulse oximetry screening involves obtaining pre-and post-ductal saturations (pulse oximetry of the right hand and of either foot) after the infant is 24 hours of age.
- Not all infants that fail pulse oximetry screening have CCHD as there are other reasons for decreased oxygen saturations. It is also possible that a baby with CCHD can have a normal pulse oximetry reading, due to a false negative screen.
- Pulse oximetry screening for CCHD has been recommended by the United States Department of Health and Human Services (HHS), the American Academy of Pediatrics (AAP), the American College of Cardiology Foundation (ACCF), and the American Heart Association (AHA).

### Protocols:

- ▶ Upon admission to the maternity unit, the mother/parents will be provided with the purple Newborn Screening Brochure. The admitting nurse will educate the mother/parents on the metabolic screening, hearing screening and CCHD screening.
- ▶ Screening will be completed when the infant is between 24 and 48 hours of age. According to AAP guidelines, the infant must be older than 24 hours. For early discharges, perform screening as close to discharge as possible.
- ▶ When possible, conduct the screening while the infant is awake, quiet, and calm.
- ▶ Do not perform pulse oximetry screening on an infant while he/she is crying, cold, or under phototherapy because any of these could affect pulse oximetry saturations.
- ▶ Equipment needed: pulse oximeter, reusable or disposable probe, CCHD screening form
- ▶ Once completed, the nurse or nursing assistant will complete the Pulse Oximetry Screening Form and give the results to mother/parents (in writing and verbally).

### Glossary of Critical Congenital Heart Disease terminology:

- **Ductus Arteriosus:** a fetal blood vessel that connects the aorta and the pulmonary artery before birth
- **Pre-ductal saturation:** the blood-oxygen saturation of blood leaving the aorta before the ductus arteriosus. This blood perfuses the brain. Pre-ductal saturation in newborns is measured on the right hand.
- **Post-ductal saturation:** the arterial blood-oxygen saturation after the blood leaves the heart and before it reaches the ductus arteriosus in the aorta and is related to the part of the aorta distal to the aortic opening of the arterial canal. Post-ductal saturation in newborns is measured on either the right foot or the left foot.

## Safe and Accurate Use of Pulse Oximetry:

- **Using a pulse oximeter**

- Turn on equipment.
- Place probe on the right hand and secure with disposable wrap (if using disposable probes).
- Connect cable to pulse oximeter.
- Check the confidence indicator to ensure the equipment is functioning properly.
- Read the saturation results and record the results on the screening form or in the electronic medical record (EMR).
- Disconnect cable from pulse oximetry. (The machine does not need to be turned off.)
- Place the probe on either foot and secure with disposable wrap (if using disposable probe).
- Reconnect cable to pulse oximeter and check confidence indicator again.
- Read saturation results and record on the screening form or in the EMR.
- Provide results to the mother/parent(s)/guardian(s) in writing and verbally.

- **Before performing pulse oximetry on an infant:**

- Review the placement education sheet in your training packet.
- Make sure that the sensor is flush on the infant's skin. There should be no gaps between the infant skin and the sensor.
- Ensure that the infant's skin is clean and dry.
- Ensure that the infant is calm and warm. Swaddle the infant while the pulse oximetry is being done. Cold temperatures, crying, and movement can all impact the accuracy of the reading.
- Check the confidence indicator to make sure the pulse oximeter reading is accurate.
- Never perform pulse oximetry and a blood pressure check at the same time. The blood pressure check will interfere with pulse oximetry reading.
- Phototherapy lights can impact the accuracy of the pulse oximetry reading. If the infant is under phototherapy lights, remove the infant for the duration of the CCHD screening.
- Pulse oximetry readings are not instantaneous. The reading displayed is an average of several measurements.

### **Health Insurance Portability and Accountability Act (HIPPA)**

- As with all medical information, results may only be shared with those participating in the infant's care.

### **Review Algorithm**

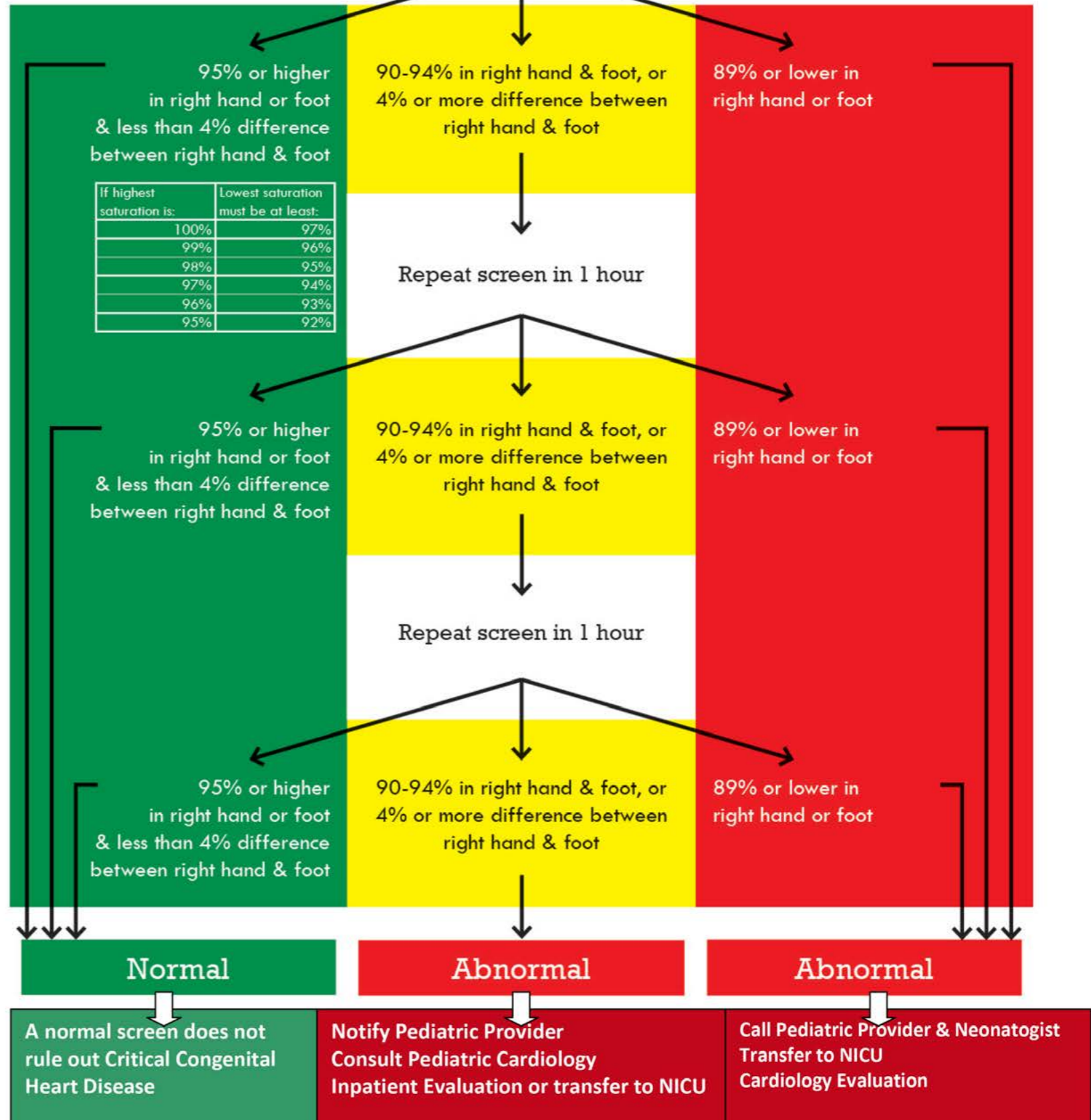
- See attached algorithm

# Newborn Pulse Oximetry Screening for Critical Congenital Heart Disease\*

**Infant in Well Baby Nursery at age 24 hours to 48 hours**

If discharged at less than 24 hours age, perform screening and notify pediatric provider for appropriate outpatient screening.

## Screen oxygen saturation in right hand and one foot



\*Please note: Screening tools are not intended to replace providers' clinical judgment. Some clinical problems may not be adequately addressed in this algorithm.

## Suggested Script for Explaining Newborn Screenings to Parent(s)

I am giving you some information on the newborn screenings that your baby will have before you leave the hospital. There are three different screenings:

**The first is a newborn blood screening.** This is a blood test that all newborns have. He/she will have a small amount of blood collected from his/her heel. The blood is tested to help diagnose metabolic (how the baby digests food) conditions, endocrine (how the body controls its own functions) conditions, and hemoglobin (blood) conditions.

In this purple brochure there is a list of all of the conditions. This blood screening is done after your baby is 24 hours old and the results will be sent to your baby's doctor after you are discharged from the hospital.

**The second is the newborn hearing screening.** The hearing screening is done by placing a small microphone in your baby's ear. This screening takes about 15 minutes and does not hurt the baby. (Often times the infant sleeps right through the screening.) You will get the results of the hearing screening before you leave the hospital. This procedure is only a screening tool and is not used to diagnose hearing loss. If your baby does not pass this screening, it does not mean he/she has hearing loss. It means that your baby needs further evaluation.

**The third screening is for Critical Congenital Heart Disease (CCHD).** This screening looks for serious heart problems in newborns. The test is painless and should take only a few minutes. It is done by performing a pulse oximetry (pulse ox) screening. A sensor is placed on your baby's right hand and one of his/her feet. The sensor is then connected to a machine (the pulse oximeter) and measures your baby's oxygen level. **This procedure is only a screening tool and is not used to diagnose a heart problem.** If your baby does not pass this screening it does not mean he/she has a heart problem. It means that he/she needs further evaluation. Also, this screening is not guaranteed to detect all problems in a baby's heart.

## Pulse Oximeter Probe Placement

1. Select application site on the outside, fleshy area of the infant's right hand or of either foot.



**Right-hand application site**



**Foot application site**

2. Place the photodetector portion of the probe on the fleshy portion of the outside of the infant's right hand or either foot.
3. Place the light emitter portion of the probe on the top of the right hand or either foot. Place the photodetector directly opposite of light emitter, on the bottom of the right hand or either food. The photodetector and emitter must be directly opposite each other in order to obtain an accurate reading.
4. Secure the probe to the infant's right hand or either foot using adhesive or foam tape recommended by the vendor. It is not recommended to use tape to secure probe placement.
5. Some vendors use visual images, such as a star or a bar, to specify which side of the probe should be placed on top of the right hand or either foot.



## Critical Congenital Heart Disease (CCHD) Screening: KNOWLEDGE ASSESSMENT

1. **The following can affect the accuracy of pulse oximetry (pulse ox) reading:**
  - a. Movement
  - b. Cold extremities or shivering
  - c. Crying
  - d. Bilirubin lamps and surgical lamps
  - e. All of the above
  
2. **True or False: One clean, disposable pulse oximeter probe can be used on up to five patients.**
  
3. **All of the following can affect the accuracy of the pulse oximeter reading except:**
  - a. Placing the pulse oximeter probe on the same extremity that you are taking the blood pressure
  - b. Performing the pulse oximeter screening while the infant is crying
  - c. Using a clip on the finger of an infant
  - d. Infant skin color or jaundice
  
4. **True or False: Pulse oximetry screening will detect all forms of Congenital Heart Disease (CHD).**
  
5. **The screening guidelines state that pulse oximetry should be performed on:**
  - a. The right hand
  - b. One foot
  - c. Both a and b
  
6. **Pulse oximetry screening should be performed when the infant is:**
  - a. Less than 8 hours
  - b. Between 8 and 18 hours
  - c. Greater than 24 hours
  - d. Less than 24 hours
  
7. **An infant's pulse oximetry readings should be reported to the infant's pediatric provider if:**
  - a. Pulse oximetry readings are greater than 95% (>95%) for both right hand and foot with more than 3% difference between the two or three screenings, each separated by one hour
  - b. Pulse oximetry readings are less than 95% (<95%) for both right hand and foot or there is more than 3% difference between the two or three screenings, each separated by one hour
  - c. Pulse oximetry reading is less than 90% (<90%) for either or both the right hand and foot
  - d. All of the above scenarios
  
8. **True or False: Pulse oximetry screening results can be shared with individuals that are not directly involved in the patient's care.**



## Critical Congenital Heart Disease (CCHD) Screening: KNOWLEDGE ASSESSMENT - ANSWERS

1. The following can affect the accuracy of pulse oximetry (pulse ox) reading:
  - a. Movement
  - b. Cold extremities or shivering
  - c. Crying
  - d. Bilirubin lamps and surgical lamps
  - e. All of the above
  
2. True or False: One clean, disposable pulse oximeter probe can be used on up to five patients.
  
3. All of the following can affect the accuracy of the pulse oximeter reading except:
  - a. Placing the pulse oximeter probe on the same extremity that you are taking the blood pressure
  - b. Performing the pulse oximeter screening while the infant is crying
  - c. Using a clip on the finger of an infant
  - d. Infant skin color or jaundice
  
4. True or False: Pulse oximetry screening will detect all forms of Congenital Heart Disease (CHD).
  
5. The screening guidelines state that pulse oximetry should be performed on:
  - a. The right hand
  - b. One foot
  - c. Both a and b
  
6. Pulse oximetry screening should be performed when the infant is:
  - a. Less than 8 hours
  - b. Between 8 and 18 hours
  - c. Greater than 24 hours
  - d. Less than 24 hours
  
7. An infant's pulse oximetry readings should be reported to the infant's pediatric provider if:
  - a. Pulse oximetry readings are higher than 95% for both right hand and foot with more than 4% difference between the two or three screenings, each separated by one hour
  - b. Pulse oximetry readings are lower than 95% for both right hand and foot or there is more than 4% difference between the two or three screenings, each separated by one hour
  - c. Pulse oximetry reading is lower than 90% for either or both the right hand and foot
  - d. All of the above scenarios
  
8. True or False: Pulse oximetry screening results can be shared with individuals that are not directly involved in the patient's care.

## Resources

### For Providers:

Rhode Island Department of Health: [www.health.ri.gov/newbornscreening/pulseoximetry/for/providers](http://www.health.ri.gov/newbornscreening/pulseoximetry/for/providers)

New England Genetics Collaborative: <http://negenetics.org/special-projects/cchd-project.aspx>

American Academy of Pediatrics: [www.aap.org](http://www.aap.org) or <http://pediatrics.aappublications.org/content/128/5/e1259.full.html>

American Heart Association: [www.amhrt.org](http://www.amhrt.org)

Center for Disease Control and Prevention: [www.cdc.gov](http://www.cdc.gov)

### For Parents:

Rhode Island Department of Health: [www.health.ri.gov/newbornscreening/for/parents](http://www.health.ri.gov/newbornscreening/for/parents)

Baby's First Test: [www.babysfirsttest.org](http://www.babysfirsttest.org)

American Heart Association: [www.amhrt.org](http://www.amhrt.org)

### Support Groups:

Children's Heart Association [www.heartchild.info](http://www.heartchild.info)

Children's Heart Foundation [www.childrensheartfoundation.org](http://www.childrensheartfoundation.org)

Congenital Heart Information Network [www.tchin.org](http://www.tchin.org)

Kids with Heart [www.kidswithheart.org](http://www.kidswithheart.org)

March of Dimes [www.shareyourstory.org](http://www.shareyourstory.org)

## Critical Congenital Heart Disease Team

Christelle Farrow, MPH  
Newborn Screening Manager  
Rhode Island Department of Health  
401-222-5950  
[Christelle.Farrow@health.ri.gov](mailto:Christelle.Farrow@health.ri.gov)

Karen Lemke, RN  
Newborn Screening Coordinator  
VNA of Care New England  
401-921-7619  
[KLemke@VNACareNewEngland.org](mailto:KLemke@VNACareNewEngland.org)

Ellen Amore, MS  
KIDSNET Manager  
Rhode Island Department of Health  
401-222-4601  
[Ellen.Amore@health.ri.gov](mailto:Ellen.Amore@health.ri.gov)

William Arias, MPH  
Birth Defects Program  
Rhode Island Department of Health  
401-222-7930  
[William.Arias@health.ri.gov](mailto:William.Arias@health.ri.gov)

James F. Padbury, MD  
Newborn Screening Task Force Chair  
Pediatrician-in-Chief  
Women & Infants Hospital  
401-274-1122  
[JPadbury@wihri.org](mailto:JPadbury@wihri.org)

Marcia W. VanVleet, MD, MPH  
Director of Newborn Service Team  
Women & Infants Hospital  
401-274-1122  
[MVanVleet@wihri.org](mailto:MVanVleet@wihri.org)

James W. Ziegler, MD  
Pediatric Cardiologist  
Hasbro Children's Hospital  
401-444-4612  
[JZiegler@Lifespan.org](mailto:JZiegler@Lifespan.org)

Erin Wilbur, MBA  
Project Coordinator  
Women & Infants Hospital  
401-274-1122  
[EWilbur@wihri.org](mailto:EWilbur@wihri.org)



**The following pages can be printed for your reference and use.**

## Critical Congenital Heart Disease (CCHD) Screening: COMPETENCY CHECKLIST

❖ Competency criteria includes the following:

- 1) Completion of the in-service education
- 2) Accomplishment of 90% or higher on the Knowledge Assessment Quiz
- 3) Appropriate application of pulse oximetry through return demonstration
- 4) Accurate reading and documentation of the pulse oximetry screening results

❖ Validation criteria:

- Discussion (D)
- Verbal Feedback (VF)
- Written Test (T)
- Return Demonstration (RD)

*Directions: Evaluator should circle the appropriate method of validation, initial each line, and sign at the bottom of the document*

Name: \_\_\_\_\_

Job Title: \_\_\_\_\_

Competency	Date	Method of Validation	Evaluator Initials	Comments
Can explain screening eligibility guidelines for pulse oximetry screening		D VF T		
Can identify safe and correct methods for performing pulse oximetry		D VF T RD		
Can describe methods to ensure that pulse oximetry reading is accurate		D VF T RD		
Can explain screening methods and guidelines for pulse oximetry screening		D VF T		
Can discuss HIPAA confidentiality standards		D VF T		

Employee Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Evaluator Name (Printed): \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_

## Critical Congenital Heart Disease (CCHD) Screening: TRAINING LOG

Each employee who will perform pulse oximetry/CCHD screening should complete the Competency Checklist prior to performing any screenings.

<b>Employee Name &amp; Title</b>	<b>Date</b>	<b>Completion of Competency Checklist</b>	<b>Evaluator Initials</b>

Unit: \_\_\_\_\_

Manager Name (Printed): \_\_\_\_\_

Manager Signature: \_\_\_\_\_

For Inpatients: AFFIX PATIENT LABEL **OR**  
WRITE IN BOTH PATIENT NAME AND MR NUMBER

Patient Name: \_\_\_\_\_

MR#: \_\_\_\_\_

For Outpatients: WRITE IN BOTH PATIENT NAME AND DOB

Patient Name: \_\_\_\_\_

DOB: \_\_\_\_/\_\_\_\_/\_\_\_\_

## PULSE OXIMETRY SCREENING

### Guidelines

- If pulse oximetry saturation is 89% or lower in right hand or foot, contact newborn's provider immediately and record as **FAIL**.
- If pulse oximetry saturation is 90-94% in right hand **and** foot, or 4% or more difference between the right hand and foot for all three screening attempts then record as **FAIL** and notify the provider.
- If pulse oximetry saturation is 95% or higher in right hand or foot with less than 4% difference between right hand and foot, record as a **PASS**.

**Patient Ineligible** (CCHD diagnosis or ECHO)

### RN / CNA to complete

#### Screening # 1

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_ Age in hours: \_\_\_\_\_

Pulse Oximetry Saturation of Right Hand: \_\_\_\_\_%

Pulse Oximetry Saturation of Foot: \_\_\_\_\_%  PASS  FAIL

Difference (Right Hand - Foot): \_\_\_\_\_%

Screeener's Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_

Printed Name: \_\_\_\_\_

#### Screening # 2 (1 hour following initial screen if the newborn fails initial screen):

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_ Age in hours: \_\_\_\_\_

Pulse Oximetry Saturation of Right Hand: \_\_\_\_\_%

Pulse Oximetry Saturation of Foot: \_\_\_\_\_%  PASS  FAIL

Difference (Right Hand - Foot): \_\_\_\_\_%

Screeener's Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_

Printed Name: \_\_\_\_\_

#### Screening # 3 (1 hour following second screen if the newborn fails second screen):

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_ Age in hours: \_\_\_\_\_

Pulse Oximetry Saturation of Right Hand: \_\_\_\_\_%

Pulse Oximetry Saturation of Foot: \_\_\_\_\_%  PASS  FAIL

Difference (Right Hand-Foot): \_\_\_\_\_%

Screeener's Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_

Printed Name: \_\_\_\_\_

**Final Interpretation:**

**PASS**

**FAIL**

**PASS Results:** I told the parent(s)/guardians and gave them a written copy of the screening results.

**FAIL Results:** I called and faxed results to: \_\_\_\_\_

**Decision of Primary Care Provider:**  **Transfer to NICU**  **Call Cardiology to evaluate as IP**

Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_

Printed Name: \_\_\_\_\_



## Refusal of Consent for Pulse Oximetry Screening

I, the parent/guardian of \_\_\_\_\_, born on \_\_\_\_\_,  
Full name of infant Date of birth

refuse to have my child (check all that apply):

- Receive Pulse Oximetry screening
- Receive Echocardiogram evaluation (ECHO), if needed
- Transported to another facility, if needed

I understand that Pulse Oximetry screening is done for the early detection of Critical Congenital Heart Disease. This dangerous heart condition can cause death or permanent disability if it is not detected early.

I have read the Newborn Screening Pulse Oximetry brochure insert and discussed Pulse Oximetry Screening with my baby's doctor, midwife, a member of the hospital nursing staff, or other healthcare provider.

I understand the benefits of screening, evaluation, and transport. The potential dangers of not receiving these services have been explained to me. My decision to refuse screening, evaluation, and/or transport was made freely and without force or encouragement by my doctor or midwife, my baby's doctor, the hospital staff, or state officials.

I accept all responsibility, legal and otherwise, for this decision.

---

Full printed name of mother	Signature	Date
-----------------------------	-----------	------

---

Full printed name of father	Signature	Date
-----------------------------	-----------	------

---

Full printed name of healthcare provider*	Signature	Date
---	-----------	------

\* Healthcare providers include physicians, nurses, and midwives.

### Healthcare provider instructions:

1. Have the parent(s) read the Critical Congenital Heart Disease insert in the Newborn Screening and Services brochure. Discuss Pulse Oximetry screening and potential follow up services (echocardiogram evaluation, transport to another facility) with the parent(s). Review the benefits of these services and the potential dangers of not receiving them.
2. Complete this form for each infant when the parent(s) refuse(s) Pulse Oximetry screening, echocardiogram evaluation, and/or transport to another facility.
3. Provide a copy of the form to the parents and send a copy to the baby's primary care provider.
4. Keep the original for your records
5. fax a copy of this form to (401)-222-1088 attn Newborn Screening
6. For additional forms, please print from the Rhode Island Department of Health website at <http://www.health.ri.gov/forms/refusalofconsent/PulseOximetry.pdf>





## **Screening for Critical Congenital Heart Disease (CCHD) with Pulse Oximetry: Frequently Asked Questions**

Screening for CCHD by checking pulse oximetry (also known as pulse ox) is recommended and supported by the U.S. Department of Health and Human Services, the American Heart Association, the American College of Cardiology, the American Academy of Pediatrics, and the March of Dimes.

### **What is Critical Congenital Heart Disease (CCHD)?**

Congenital Heart Disease (CHD) is when a baby's heart develops in a different way before birth. Congenital means that the baby is born with the birth defect. CHD is the most common type of birth defect. Some forms of CHD are more serious than others and need treatment sooner. These more serious forms are called Critical Congenital Heart Disease or CCHD.

### **How common is CCHD?**

In the US, about 7,200 (or 2 per 1,000) babies born each year have CCHD.

### **What causes CCHD?**

We do not know what causes CCHD in most babies.

### **What is pulse oximetry (also known as pulse ox)?**

Pulse oximetry is a simple way of measuring how much oxygen your baby's blood is carrying. It involves attaching a small, sticky sensor to your baby's hand and foot for about 1 minute. It is painless. It has no side effects.

### **What is a normal pulse oximetry reading?**

In healthy babies, normal pulse oximetry readings are between 95%-100%, with less than a 4% difference between the reading from the right hand and either foot. A baby with CCHD can have a normal pulse oximetry reading, so a passing result of the pulse oximetry screening does not rule out CCHD.

### **What does it mean if my baby does not pass the pulse oximetry screening?**

If the pulse oximetry screening shows a low oxygen level, this does not automatically mean your baby has CCHD. Sometimes a newborn's lungs and heart are still adjusting after birth. This can also lead to a low pulse oximetry reading.

### **What happens next if my baby does not pass the pulse oximetry screening?**

Your baby's doctor or nurse will speak with you and order other tests. These tests might include another pulse oximetry reading, a chest x-ray, and/or an ultrasound (echocardiogram or "ECHO") of the heart.

### **Who will perform the follow-up tests?**

Your baby's nurse or a nursing assistant will complete a follow-up pulse oximetry. A radiology technician will perform a chest x-ray. A cardiologist or an echocardiography technician will perform an ECHO. Your baby may need to be transferred to another hospital to get these tests.

**When will we get the results?**

You will have the results of any tests soon after they are done, usually before your baby leaves the hospital. Your doctor will let you know when the tests will be done and when you will get the results.

**What is the treatment for CCHD?**

CCHD usually requires surgery to repair the heart. Your baby may not need surgery during this hospital stay. A pediatric cardiologist (heart doctor) will explain what happens next.

**Support Groups and Online Resources:**

American Heart Association	<a href="http://www.amhrt.org">www.amhrt.org</a>
Baby's First Test	<a href="http://www.babysfirsttest.org">www.babysfirsttest.org</a>
Children's Heart Association	<a href="http://www.heartchild.info">www.heartchild.info</a>
Children's Heart Foundation	<a href="http://www.childrensheartfoundation.org">www.childrensheartfoundation.org</a>
Congenital Heart Information Network	<a href="http://www.tchin.org">www.tchin.org</a>
Kids with Heart	<a href="http://www.kidswithheart.org">www.kidswithheart.org</a>
March of Dimes	<a href="http://www.marchofdimes.org/baby/congenital-heart-defects.aspx">www.marchofdimes.org/baby/congenital-heart-defects.aspx</a>
March of Dimes	<a href="http://www.shareyourstory.org">www.shareyourstory.org</a>