PEDDIATRIC NEWBORN MEDICINE
CLINICAL PRACTICE GUIDELINES

Screening for Critical Congenital Heart Disease

© Department of Pediatric Newborn Medicine, Brigham and Women’s Hospital
Points of emphasis/Primary changes in practice:

CCHD Screening is mandated for all newborns prior to discharge from the hospital, unless medically contraindicated.

Questions? Please contact: Medical Director of Well Newborn Care

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<th>Clinical Guideline Name</th>
<th>Screening for Critical Congenital Heart Disease</th>
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<tr>
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<td>March 1, 2021</td>
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<tr>
<td>Contact Person</td>
<td>Medical Director of Well Newborn Care</td>
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| Approved By             | Dept of Pediatric Newborn Medicine Clinical Practice Council  
                          | CWN SPP 3/11/20                                |
                          | SPP Steering ________                          |
                          | Nurse Executive Board/CNO 3/11/20              |

This is a clinical practice guideline. While the guideline is useful in approaching screening for critical congenital heart disease, clinical judgment and / or new evidence may favor an alternative plan of care, the rationale for which should be documented in the medical record.

I. Purpose
The purpose of this clinical practice guideline is to outline procedures related to the routine screening of newborns for critical congenital heart disease.

II. Reliance
All CPGs will rely on the Nursing CWN Clinical Practice Manual. All relevant nursing PPGs are listed below.

- WNH Standard Policy Statements
- WNH D.3 Discharge of an Infant
- WNH H.1 CWN Hand-off communication
- WNH L.1 Infant Identification
- WNH R.4 Newborn Rapid Response Situations and Infant Codes (CPG)
- WNH T.4 Infant Transport

III. Scope
These guidelines apply to infants in the Neonatal Intensive care Unit (NICU) and the Well Baby Nursery (WBN).
III. Guidelines
All infants, except those who have had an echocardiogram, will be screened for CCHD.

Information:
CCHD Screening in the WBN
- CCHD screening should be performed when the infant is between 24 and 48 hours of life (HOL)
  - Earlier screening can lead to false positive results because of the transition from fetal to neonatal circulation and stabilization of systemic oxygen saturation levels.
  - In general, screening closer to 48 HOL is desirable because of an increased likelihood to detect emerging ductal dependent CCHD.
- If discharge prior to 24 HOL is planned, complete as close to discharge as possible. Follow up screening at primary care pediatrician’s office is recommended.
- Screening should be performed by a registered nurse. Oxygen saturation (SpO₂) is measured in the right hand (preductal) and either foot (postductal). Screening at both locations can occur simultaneously or in direct sequence. Postductal measurement of SpO₂ is important because defects with right-to-left shunting of desaturated blood through the ductus arteriosus will not be detected with only preductal measurement.
- All infants in the WBN who fail the first screening will be transferred immediately to NICU (<90%). If SpO₂ is 90-94%, repeat according to algorithm. SPO₂ 95% or greater is considered a pass.
- Any infant in WBN who meets early warning criteria for a Rapid Response Situation (RRS) will have a RRS called.

CCHD Screening in the NICU
NICU infants, when medically appropriate, should be screened as part of the discharge process.
- The presence of lung disease and other illness makes the interpretation of saturation data much more complex in these infants and CCHD screening at 24 hours after birth is often not possible.
- For those infants who have not had echocardiography performed as part of their care, the CCHD screening protocol should be followed once they have been weaned from supplemental oxygen. CCHD screening does not need to be performed prior to discharge if the baby has already had an echocardiogram.
PROCEDURE
Preparation and procedure
1. Parents/guardians should be provided with written information about the test; and the test results should be discussed with the parents/guardians
2. Obtain the pulse oximeter(s) and disposable/reusable sensor(s).
   - Screening can occur simultaneously or direct sequence
3. Turn pulse oximeter(s) on.
   - Allow time for self-test to run.
4. Select the application site.
   - Make sure that the skin is clean and dry before applying the sensor.
   - Place the photodetector portion of the sensor on the fleshy portion of the outside of the infant’s hand or foot.
   - Place the light emitter portion of the sensor on the top of the hand or foot directly opposite the photodetector.
   - Right hand (pre-ductal) around the right palm with the light under the 4th or 5th finger
   - Either foot (post-ductal) o place outer aspect of foot with the light under the 4th or 5th toe, either foot acceptable
5. Calm and swaddle infant as necessary.
   - Pulse oximetry takes just a few minutes to perform when the infant is quiet, alert, and warm.
8. Check waveform / signal quality as appropriate to the equipment.
   - Pulse oximeters have different confidence indicators to ensure the pulse oximeter reading is accurate.
9. Keep pulse oximeter probe on hand/foot until pulse indicates accuracy.
   - Test is considered complete once 10 seconds of reliable pulse oximetry has been achieved.
Interpretation
Utilize algorithm attached for screening interpretation.
Notify responding clinician of a FAIL or a RETEST. Responding clinician is responsible for discussing results with parents/guardians.
   Initial Screen:
   - PASS = SpO₂ ≥ 95% and ≤3 % difference between hand and foot
   - FAIL = SpO₂ < 90% on hand or foot
   - RETEST = SpO₂ is 90-94% or > 3 % difference between hand and foot
   
   If RETEST:
   Keep pulse oximeter on and monitor infant in nursery.
   Repeat screen in one hour x1 (2 total screens):
   - PASS = SpO₂ is ≥ 95% in both the hand and foot and ≤ 3% difference
• FAIL = SpO$_2$ < 95% on hand or foot and/or > 3 % difference between hand and foot.

Based on physiologic criteria and staff concern, RRS activation or transfer to the NICU will be initiated for all infants who FAIL CCHD screening.

The following CCHD pulse oximetry screening information in the infant’s medical record.

• Whether written CCHD screening information given to parents/guardians, AND results discussed with parents/guardians

• If the screen was not done on an infant, this should be documented in the medical record, as well as the reason the test was not done such as the medical condition of the newborn or a religious objection of the parent/guardian.

Cleaning
1. Clean reusable sensor with hospital approved disinfectant after each use.

OR

2. Discard single use probes after test.

References:


FIGURE 2
Revised algorithm for CHD screening with pulse oximetry. RH, right hand.