

Title: Critical Congenital Heart Disease Pulse Oximetry Screening – Community Screening Protocol (Non-Hospital Setting)

Purpose:

- To provide a guideline for management to those performing Critical Congenital Heart Disease (CCHD) Pulse Oximetry Screens in the newborn's home or non-hospital environment.

Scope or Principle:

This protocol provides a guideline for Health Care Providers who perform the Critical Congenital Heart Disease (CCHD) Pulse Oximetry Screen in a home or non-hospital environment.

Background:

CCHD screening in asymptomatic newborns can assist in the early identification and treatment of CCHD, resulting in better outcomes for affected babies. If a positive result is obtained, urgent consultation or referral to a physician is warranted.

Responsibility:

Health Care Providers (HCPs) caring for newborns during the first days of life should be familiar with the protocol and offer the CCHD screen to parents/families of their newborns.

Definitions/Acronyms:


- NSO = Newborn Screening Ontario
- CCHD = Critical Congenital Heart Disease
- HCP = Health Care Provider
- SpO₂ = Saturation of pulse oximetry, measurement of oxygen saturation
- DBS card = Dried Blood Spot card

Related Documentation:

- Newborn Screening Ontario Critical Congenital Heart Disease Pulse Oximetry Screening Protocol
- Newborn Screening Ontario Critical Congenital Heart Disease Pulse Oximetry Positive Screen Workup Protocol

Protocol:

1. Offer the CCHD screen as part of an informed choice discussion. This may include providing the NSO CCHD education information brochure/insert to parents/families of the newborn.
2. The CCHD screen using pulse oximetry will be performed ideally when the newborn is between 24 and 48 hours of age, with an optimal window of 24-36 hours of age. Screens performed prior to 24 hours of age have been shown to demonstrate a higher false positive rate than screens performed in the suggested 24-48 hour window (0.5% as opposed to 0.05%). Delaying the screen past 48 hours increases the risk for an affected newborn to become symptomatic and clinically deteriorate, potentially delaying access to treatment.
3. Position the pulse oximeter probe on the RIGHT hand for a pre-ductal oxygen saturation measurement (SpO₂) and subsequently on EITHER foot for a post-ductal oxygen saturation measurement (SpO₂). Align the light emitter portion of the PO probe facing the photodetector portion of the PO probe.
4. Perform the CCHD screen consecutively, the first measurement directly followed by the second measurement.

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5. Conduct the CCHD screen using a motion tolerant pulse oximeter approved by or provided by NSO.
 6. The newborn should ideally be in a quiet, non-fussing state. Complete the CCHD screen prior to any invasive procedure or care activity that disturbs the infant.
 7. Once a reliable signal is obtained (this will be evident using confidence indicators specific to the monitor e.g. pleth/waveform is regular), observe the oxygen saturation (SpO2) values for 30 seconds and note the highest SpO2 value achieved.
 8. Document the pre-ductal and post-ductal result, as well as the interpretation of the result (pass/refer) on the CCHD screen portion of the DBS card. Send the card to NSO using your existing DBS card submission process.

Evaluation of Results:

Evaluate the 2 measurements (pre-ductal and post-ductal) using the NSO approved CCHD Algorithm and/or the NSO CCHD Evaluation Chart (refer to Appendix A and Appendix B)

Screen Negative (Pass)

If the pulse oximetry is greater than or equal to 95% in the right hand or either foot AND with less than or equal to 3% difference in oxygen saturation between the right hand and foot:

No further screening is required.

Screen Positive (Refer)

If the pulse oximetry is less than 90% in right hand and either foot:

Refer Immediately (do not repeat)

OR

If the pulse oximetry is 90-94 % in both right hand and either foot OR pulse oximetry difference in oxygen saturation is greater than 3% between the right hand and either foot for 3 consecutive measures each separated by 1 hour

Referral to or consultation with physician for further investigation is warranted

Note: after 2 'Repeat' screen results, exercise clinical judgement and consider conducting the third screen in a hospital setting. This would facilitate access to care (or minimize time to physician assessment) in anticipation of a screen positive (REFER) result.

Screen Positive Result:

If a screen positive result is obtained from a CCHD screen occurring in a non-hospital environment, an immediate consultation with a physician for assessment is warranted. **Follow your usual newborn referral protocol as appropriate per clinical picture.**



References:

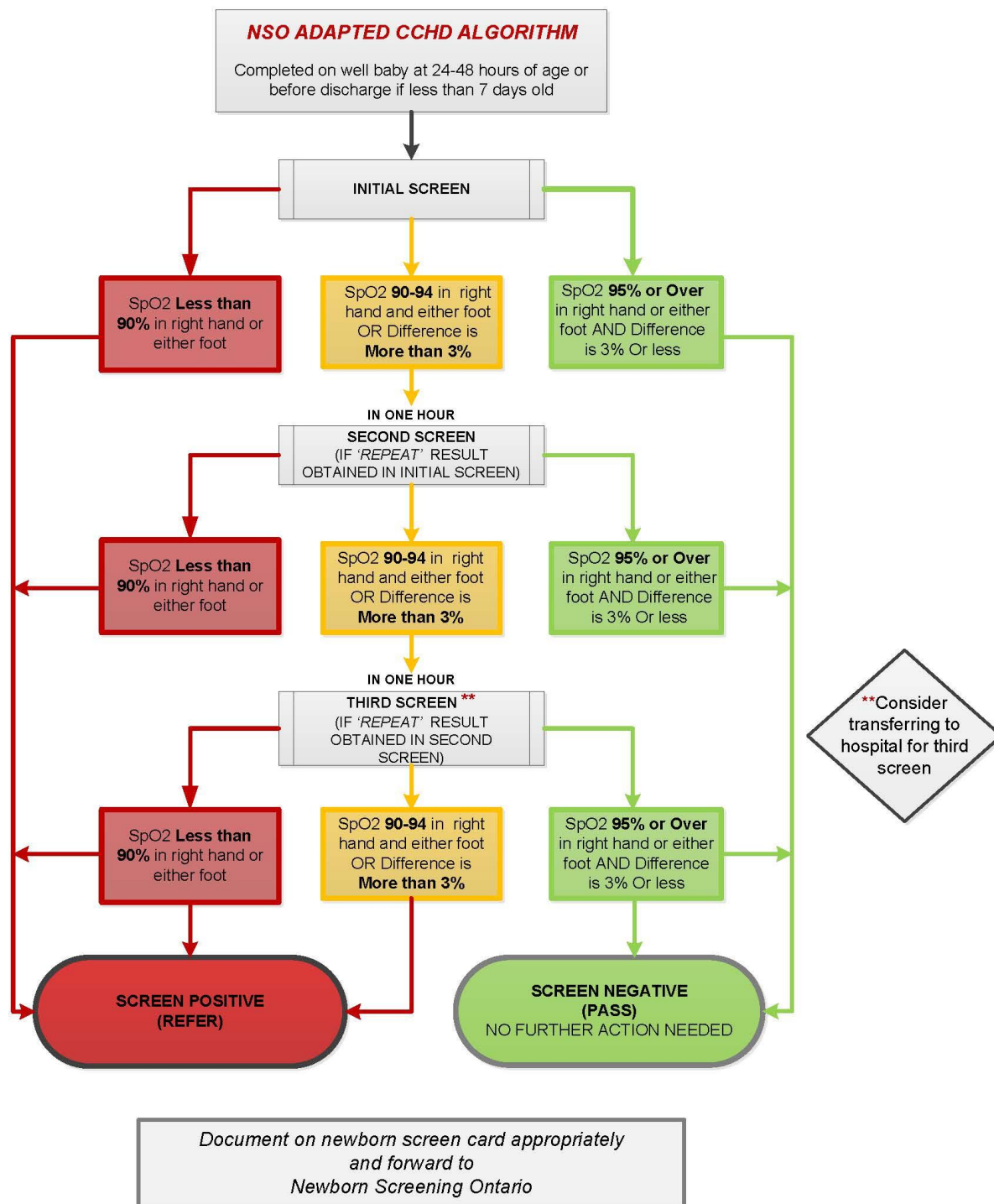
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Reviewed by:

- CCHD Disease Specific Working Group (2017/03)
- CCHD Midwifery Task Force (2017/04)
- CCHD Hospital Advisory Group (2017/05)

Appendix A:

NSO Adapted CCHD Algorithm with Non-Hospital comment



(Adapted from Kemper et al, 2011)



Appendix B:

Newborn Screening CCHD Evaluation Chart

		RIGHT Hand Pulse Oximetry Measurement												
		100	99	98	97	96	95	94	93	92	91	90	≤89	
Either Foot Pulse Oximetry Measurement	100	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	PASS Screen complete
	99	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	
	98	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	
	97	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	REPEAT In 1 hr (max 2 repeats)
	96	Yellow	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Red	
	95	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Red	
	94	Yellow	Yellow	Yellow	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Red	REFER Physician assessment required
	93	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Red	
	92	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Red	
	91	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	
	90	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	
	≤89	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	

(Adapted from Utah Department of Public Health)