

**Royal Hospital for Women (RHW)**  
**NEONATAL BUSINESS RULE**  
**COVER SHEET**



**Health**  
South Eastern Sydney  
Local Health District

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<b>SUMMARY</b>	To outline the process for oxygen saturation screening via a pulse oximeter for the detection of Congenital Cyanotic Heart Disease in newborn neonates.
<b>Key Words</b>	Pulse oximetry, screening, oxygen saturation, neonate, CERS, congenital cyanotic heart disease, pulse oximeter

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## Pulse Oximetry Screening of Newborns

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## 1 BACKGROUND

Pulse oximetry screening is performed for all newborns to identify serious congenital cyanotic heart disease (CCHD)<sup>1</sup>. Pulse oximetry screening detects hypoxaemic neonates and has been shown to improve the early diagnosis of CCHD in newborns.<sup>1</sup>

## 2 RESPONSIBILITIES

### 2.1 Staff

- 2.1.1 Medical – to screen newborn neonates, to examine neonates whose saturations are <95%, to order and perform investigations as required, to liaise with cardiology team as needed, document screening in neonate's medical record.
- 2.1.2 Nursing/ Midwifery – to screen newborn neonates, to liaise with medical team for neonates with abnormal results, to document screen in neonate's medical record.

## 3 PROCEDURE

### 3.1 Equipment

- Pulse oximeter sensitised for neonatal use
- Reusable saturation probe
- Non- adhesive wrap
- Neutral detergent wipes

### 3.2 Eligibility criteria

- All newborn neonates with a gestational age  $\geq$  35 weeks

### 3.3 Exclusion criteria

- Parental refusal
- Neonates for palliative care
- Neonates with an antenatal diagnosis of Congenital Heart Disease (CHD)

### 3.4 Special considerations

- Neonates < 35 weeks' gestation at birth will generally be admitted to Newborn Care Centre where they will be monitored as part of the standard care.

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- On the rare occasion they are admitted to postnatal ward, pulse oximetry screening should be performed
- If screening did not take place in the first 24 hours in an otherwise healthy neonate, the test should be performed at the earliest possible opportunity.

### 3.5 Clinical Practice

- Begin screening between 4 to 24 hours after birth.
- Screen as close to discharge as possible if discharge <24 hours of age planned.
- Measure the pulse oximetry on either foot as follows:
  - Clean pulse oximeter cable and probe head with neutral detergent wipe prior to use
  - Perform hand hygiene
  - Ensure neonate is alert and settled as it provides a more accurate reading
    - The screening can be performed whilst the neonate is feeding
  - Apply saturation probe on neonate prior to commencing other observation actions
  - Secure the saturation probe around the foot with non- adhesive wrap
  - Switch pulse oximeter on
  - Allow pulse oximeter to equilibrate (about 30 seconds), and make sure the waveform on the oximeter is stable
  - Record reading on:
    - Standard Neonatal Observation Chart (SNOC)
    - Neonatal care plan
    - Personal Health Record Book (blue book - on newborn examination sheet next to cardiovascular row)
    - eMaternity discharge summary or
    - eRIC discharge summary or
    - eMR discharge summary
  - Perform hand hygiene and dispose of equipment as required

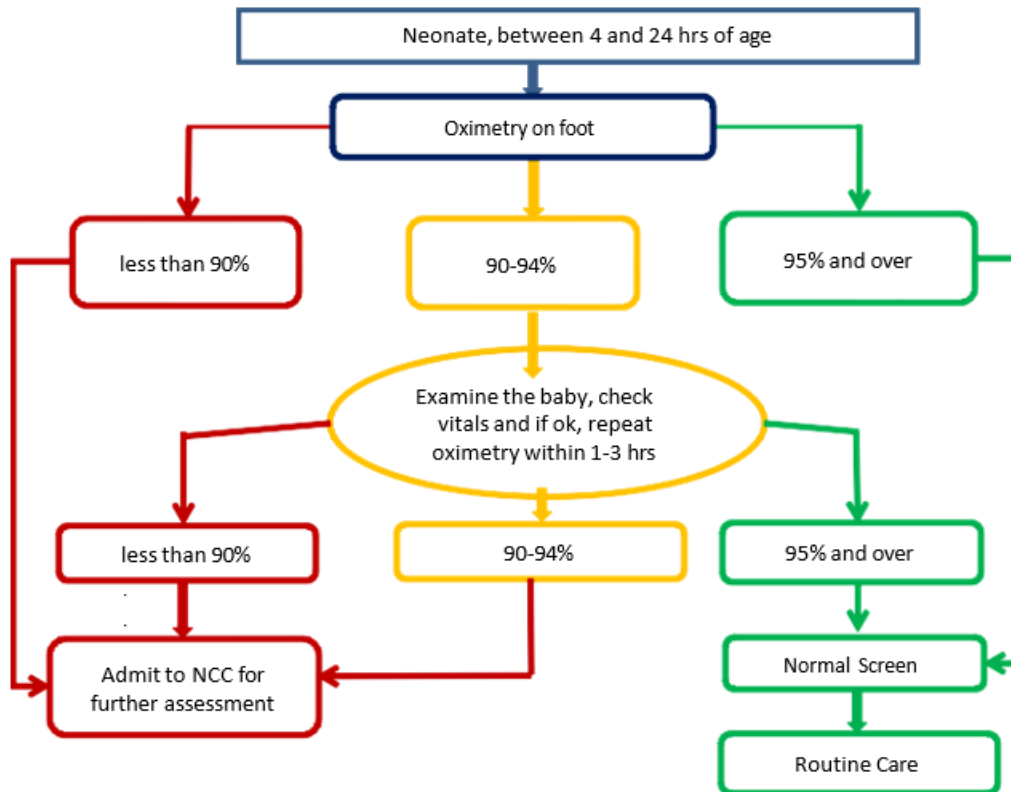
**Note:**

Pulse oximetry screening does not replace the newborn clinical assessment for congenital heart disease. Auscultating for murmurs, detection of clinically visible cyanosis and palpation of pulses (femoral pulses in particular) remain an important part of the newborn examination. Clinical concerns warrant an immediate referral to the paediatric team.

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- Follow the steps in the flow diagram below for actions to undertake post screening



- Normal Screen: Saturations  $\geq 95\%$  and over
- Abnormal Screen:
  - Saturations  $<90\%$ , - initiate a Rapid Response as per Clinical Emergency Response System (CERS) criteria and admit to Newborn Care Centre for ongoing monitoring
  - Saturations 90-94% - consider Clinical Review, examine neonate and attend to vital signs (temperature, respiration and heart rate). Repeat saturations at next feed or within 1 to 3 hrs, whichever occurs earlier
  - Notify Paediatric team on duty
  - Paediatric team to evaluate the neonate including physical examination, 4-limb blood pressure measurement, pre and post-ductal saturations reading, ie. right hand and foot, and any other tests suggested by neonatal fellow/consultant
  - If any obvious respiratory or other non-cardiac cause for hypoxia (e.g. sepsis) – treat the cause and reassess
  - If no obvious cause - consult the cardiology team for further advice and management

### 3.6 Documentation

- eRIC
- SNOC
- eMR
- Neonatal Care Plan
- Personal Health Record (Blue Book) Newborn examination page
- eMaternity discharge summary

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### 3.7 Education Notes

- For neonates born at home, midwives will complete pulse oximetry screening at or after 4 hours of life prior to leaving a homebirth. If this isn't possible, the midwife will complete the screening within 24 hours of birth.
- Pulse oximetry screening is targeted to identify those newborns with structural heart defects usually associated with hypoxia in the newborn period that could have significant morbidity or mortality early in life if not diagnosed early.<sup>2</sup>
- The seven specific cardiac lesions targeted for screening are: Hypoplastic Left Heart Syndrome, Pulmonary Atresia, Tetralogy of Fallot, Total Anomalous Pulmonary Venous Return, Transposition of the Great Arteries, Tricuspid Atresia and Truncus Arteriosus. This subset of lesions excludes those not usually associated with hypoxia (eg, aortic valve stenosis)<sup>2</sup>.
- Pulse oximetry can also identify non-cardiac problems such as sepsis and respiratory problems, and these are common causes of a positive screen.
- A Cochrane Review on pulse oximetry screening found:<sup>3</sup>
  - Overall sensitivity 76.3% (95% CI 69.5–82.0)
  - Specificity 99.9% (95% CI 99.7–99.9)
  - No significant differences in sensitivity or specificity for foot only versus both foot and right hand measurement
- With abnormal screening, in the absence of other findings to explain hypoxia, a cardiology review is recommended. Other evaluations such as chest x-ray, ECG and hyperoxia test can be inaccurate for diagnosing Congenital Heart Defects (CHD).

### 3.8 Abbreviations

CCHD	Congenital Cyanotic Heart Disease	CHD	Congenital Heart Disease
SNOC	Standard Neonatal Observation Chart	CERS	Clinical Emergency Response System
ECG	Electrocardiograph		

### 3.9 Related Policies/procedures

- RHW LOP- Admission of a Neonate to Newborn Care Centre
- RHW LOP- Admission of a Neonate to Postnatal Ward
- RHW LOP- Homebirth (Publicly Funded): Criteria and Process
- RHW LOP- Deteriorating Neonate- Recognition and Management inside Newborn Care Centre
- RHW LOP- Recognition and Management of Neonate who is Clinically Deteriorating outside of Newborn Care Centre (NCC)
- RHW LOP- Neonatal Observations outside of Newborn Care Centre

### 3.10 References

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1. Cloete E, Gentles TL, Webster DR, et al. Pulse oximetry screening in a midwifery-led maternity setting with high antenatal detection of congenital heart disease. *Acta Paediatrica*. 2019;109(1):100–8. <https://doi.org/10.1111/apa.14934>
2. Jullien, S. Newborn pulse oximetry screening for critical congenital heart defects. *BMC Pediatr*. 2021; 21(Suppl 1):305. <https://doi.org/10.1186/s12887-021-02520-7>
3. Plana MN, Zamora J, Suresh G, et al. Pulse oximetry screening for critical congenital heart defects (review). *Cochrane Database Systematic Reviews*. [Internet]. 2018 [cited 16.09.2024]; Issue 3. Art. No.: CD011912(3):Cd011912. <https://doi.org/10.1002/14651858.CD011912.pub2>

## 4 ABORIGINAL HEALTH IMPACT STATEMENT DOCUMENTATION

- Considerations for culturally safe and appropriate care provision have been made in the development of this Business Rule and will be accounted for in its implementation.
- When clinical risks are identified for an Aboriginal and/or Torres Strait Islander woman or family, they may require additional supports. This may include Aboriginal health professionals such as Aboriginal liaison officers, health workers or other culturally specific services

## 5 CULTURAL SUPPORT

- For a Culturally and Linguistically Diverse CALD woman, notify the nominated cross-cultural health worker during Monday to Friday business hours
- If the woman is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017 044-Interpreters Standard Procedures for Working with Health Care Interpreters.

## 6 NATIONAL STANDARDS

- Standard 1 Clinical Governance
- Standard 2 Partnering with Consumers
- Standard 5 Comprehensive Care
- Standard 6 Communicating for Safety
- Standard 8 Recognising and Responding to Acute Deterioration

## 7 REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
16.5.2012	1	Endorsed Neonatal Services Management Committee
21.6.2012		Approved Quality & Patient Safety Committee

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15.5.2018	2	NCC Quality Committee. Reviewed and endorsed Neonatal Services LOPs
16.09.2024	3	R Jackson (NE), S Bolisetty (Medical Co- Director)
3.10.2024		Endorsed by NCC CBR Committee
21.10.24		Endorsed by RHW BRGC



BUSINESS RULE

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