



## CLINICAL PRACTICE GUIDELINE

Guideline coverage includes NICU KEMH, NICU PMH and NETS WA

# Pulse Oximetry Screening to Detect Critical Congenital Heart Disease (CHD)

This document should be read in conjunction with the [Disclaimer](#)

## Key Points

- Pulse oximetry can detect some critical congenital heart disease that would otherwise be missed on routine examination / antenatal USS.
- The ideal time for oximetry is > 24 hours.
- The probe should be sited on the lower limb.
- 95% is considered normal and a baby can then be discharged as normal.
- Verbal consent should be obtained and the screen documented in the notes with the stamp.

## Background Information

Critical congenital heart disease can be diagnosed by fetal ultrasound, however around 50% will still be missed. Babies may lack clinical signs in the first day of life, appearing pink despite a “cyanotic” heart lesion, with lack of murmur and apparently palpable femoral pulses in coarctations. A UK study estimated that 25% of babies with congenital cyanotic heart disease are not diagnosed until after discharge from the nursery. Delayed diagnosis can be associated with increased mortality and morbidity from multi-organ damage. At least 3 babies have been identified at KEMH over the last 8 years who were discharged with a critical congenital heart lesion undetected.

There is a significant amount of data to suggest that routine use of pulse oximetry before discharge will diagnose a substantial proportion of babies who would have otherwise been missed by routine examination (~50%). The data is all from observational studies

**THIS MEANS for every 1000 babies screened about 7 cases need further evaluation with 1 in 5 of those having a critical heart lesion.**

Timing of the screening is important, if done after 24 hours the screening outcomes were improved to a positive predictive value of 47%.

The majority of the data comes from screening lower limb at  $\geq 95\%$  cut off. Some studies have also included a measurement of the difference between upper and lower limb (to rule out coarctation of the aorta). Certainly coarctation of the aorta remains a diagnostic challenge and in the studies reviewed by AAP this is the cardiac lesion least likely to be found with the oximetry screening test. Due to the limitation on the numbers in the studies that used upper and lower limb saturation difference we have decided not to do both limbs but just the lower limb saturations.

## Screening Protocol

**Parents to be provided with information sheet and verbal consent should be obtained.**

Medical staff to screen all neonates born at KEMH prior to discharge (ideally at > 24 hours age, but for early discharge within 1 hour of discharge) with **lower limb** O<sub>2</sub> saturations. The screening should occur around the time of the RMO discharge review. Take the highest number the trace gets to as the screening number (the probe only needs be only on until a good steady trace is obtained which may take < 1 minute). The baby should not be feeding and should be settled.

### Normal > 95% oxygen saturation

**If O<sub>2</sub> saturations 90-94%** → medical review to consider other causes (mainly sepsis). If well with a normal examination → repeat screening test every 3-4 hours when baby settled. If still abnormal after 2 repeated examinations → for a senior review (SR or Consultant) and refer to cardiology as necessary. This may be next day depending on timing and **THIS MAY POSTPONE DISCHARGE** (hence consent needed to do screen). If there are any concerns about baby they should be admitted to SCN.

**If O<sub>2</sub> saturations < 90%** → **admit to SCN immediately** and for senior review and continuous oximetry. Other causes need to be excluded (with possible septic work up and IV antibiotics, CXR and assessment other problems: upper airway, neurological, polycythaemia, persistent pulmonary hypertension). Studies show up to 50% of babies screening positive have signs of sepsis on further evaluation <sup>[2]</sup>. If no other cause found echocardiogram to be performed at time dictated by Cardiologist (may be next day but prior to discharge).

## Documentation

Special stamp as displayed below should be completed in the patient notes with each screen (up to 3). Parent information leaflets are available and can be distributed to all parents prior to the screen with verbal consent.

### Oximetry Screen:

Date: .....

Time: .....

O<sub>2</sub>sat ≥ 95%: ..... DISCHARGE

O<sub>2</sub>sat 91-94%: ..... Repeat 3-4hrs  
and RMO review

O<sub>2</sub>sat ≤ 90%: ..... Admit SCN,  
immediate review

Signed:.....


Print Name: .....

Designation: .....

Tick Box

## References

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