GUIDELINE

Cardiac Murmur

Scope (Staff):	Nursing, Midwifery and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA, KEMH Postnatal Wards

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations.

Read the full statement here:
CAHS Child Safe Organisation Commitment Statement.

This document should be read in conjunction with this disclaimer

Aim

To guide management of a neonate detected to have a cardiac murmur.

Risk

Increased risk of missing a potentially serious congenital cardiac condition if managed inappropriately.

Cardiac Assessment of all Babies

Heart murmurs may be detected on routine neonatal examination and warrant thorough evaluation and assessment in conjunction with senior medical staff.

A thorough examination of the newborn infant includes:

- Assessment of colour for cyanosis or pallor.
- Auscultation for normal heart sounds and presence of a murmur.
- Pulse oximetry (pre and post-ductal) The presence of central cyanosis or hypoxaemia (SaO_2 < 90%) require immediate senior review and admission to SCN for further management. Measuring oximetry in the upper limbs and lower limbs is essential as differential saturations may suggest ductal dependent lesions, even in the absence of typical signs (murmur, diminished or absent femoral pulses, acidosis). See Pulse Oximetry Screening to Detect Critical Congenital Heart Disease for timing in newborns.
- Feel the precordial impulse for heave or thrill, displaced apex beat.
- Assessment of brachial and femoral pulses and skin perfusion.

- Review of feeding history, behaviour and determination if presence of known risk factors of congenital cardiac disease, including no antenatal care.

Features of innocent/ physiological murmurs

- Soft and low pitched, Grade ≤2 intensity
- Short duration in systole
- Heard best at the left lower sternal border or at the apex of the heart
- Minimal radiation to other areas of the chest
- Musical or vibratory quality
- Absence of respiratory signs, impact on feeding or behaviour

Red Flags

Characteristics of pathological or significant cardiac murmurs:

- Harsh, and loud (Grade ≥3 [out of 6] intensity)
- Continuous, pansystolic or diastolic across the cardiac cycle
- Radiate through the chest/back/neck
- Presence of cardiovascular (pallor, cyanosis, shock, lower limb saturations <95%, > 3% difference in pre and post ductal oximetry saturations); or respiratory signs (tachypnoea, WOB, apnoea); hepatomegaly, poor feeding, or lethargy.

Congenital Heart Disease (CHD)

Congenital Heart Disease (CHD) affects around 1% of newborns, with factors documenting for increased risk:

- Sibling/Parent with CHD (risk higher if maternal CHD)
- Maternal diabetes mellitus
- Cardiac abnormality on fetal anomaly scans
- Dysmorphic syndromes and structural malformations
- Suspected or confirmed congenital infection
- Excessive maternal alcohol intake during pregnancy Medications taken during pregnancy e.g. amphetamines, anticonvulsants, lithium, valproic acid, angiotensin-converting enzyme inhibitors, retinoic acid

Cardiac Murmur Management

All babies in whom there is a clinical suspicion of congenital heart disease require immediate review by the Senior Registrar or Consultant Neonatologist

on service, followed by discussion and e-referral to the on-call Paediatric Cardiologist at PCH.

Red flags and features warranting immediate senior review and NICU admission include a loud murmur, radiation, presence of thrill or heave, abnormal pulse oximetry or pulses, perfusion and colour, hepatomegaly, abnormal RR/WOB, feeding and behaviour. Investigations in NICU include cardiovascular monitoring, CXR, ECG, 4-limb BP, blood gas and immediate referral to PCH cardiology.

Diagnostic echocardiograms are undertaken solely by Paediatric Cardiology and are beyond the scope of clinical performed ultrasounds within neonatology.

If a murmur is detected on pre-discharge examination, and no other clinical signs of concern (normal oximetry (SaO_2 ≥95%), femoral pulses, RR, HR, feeding/behaviour etc.), the neonatologist will decide if the baby can be reviewed at their routine 6 week check and referred if the murmur persists, or if a discussion with the on-call Cardiologist is warranted. If Cardiologist referral is considered necessary, then an e-referral should be arranged for PCH outpatient clinic follow up. CXR & ECG are usually not routinely required.

Parents should be counselled on signs to look out for in their baby, and advised to present to their nearest emergency department or doctor if their baby:

- Becomes unwell
- Looks pale or blue
- Has difficulty with his or her breathing
- Is finding it difficult to feed, or is breathless or sweaty during feeds

Parents and GP to be provided with Cardiac Murmur Information and Follow up Letter.

Related CAHS internal policies, procedures and guidelines

Neonatology Clinical Guidelines

- Congenital Heart Disease: Presentation and Initial Management of Duct-Dependent Lesions
- Pulse Oximetry Screening to Detect Critical Congenital Heart Disease

References

1. Yoon SA, Hong WH, Cho HJ. Congenital heart disease diagnosed with echocardiogram in newborns with asymptomatic cardiac murmurs: a systematic review. BMC Pediatr. 2020 Jun 30;20(1):322. doi: 10.1186/s12887-020-02212-8. PMID: 32605548; PMCID: PMC7325562.
2. Oswal A, Holman J. Fifteen-minute consultation: Cardiac murmurs in the Newborn Infant Physical Examination (NIPE). Arch Dis Child Educ Pract Ed. 2022 Oct;107(5):326-329. doi: 10.1136/archdischild-2020-321206. Epub 2021 Jun 29. PMID: 34187902.
3. Hiremath G, Kamat D. When to call the cardiologist: treatment approaches to neonatal heart murmur. Pediatr Ann. 2013 Aug;42(8):329-33. PMID: 23910039. DOI: 10.3928/00904481-20130723-13

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