

NEONATAL MEDICAL CONDITIONS

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7 Cardiac murmur
Neonatal Postnatal
Clinical Guidelines
King Edward Memorial Hospital
Perth Western Australia

BACKGROUND INFORMATION

CONGENITAL HEART DISEASE

Congenital Heart Disease (CHD) affects around 1% of newborns, but paradoxically the more serious lesions including duct dependent lesions do not always have physical signs on the first day of life, whereas small lesions such as a small VSD which will have no clinical significance may have abnormal signs. Antenatal ultrasound (US) will diagnose around 50% of cases of CHD, and physical examination diagnoses another 25%, leaving around 25% undiagnosed.¹

Risk factors for congenital heart disease include:

- Maternal diabetes (increases risk 2-3 times)²
- Other syndromes / dysmorphic features
- extra cardiac congenital anomalies esp. renal, GIT, orthopaedic
- TORCH infection
- Family history (first degree relatives)

CARDIAC ASSESSMENT OF ALL BABIES

Cardiac assessment is an important part of the newborn examination which includes:

- assessment of colour for cyanosis or pallor
- assessment of peripheral pulses including femoral pulses (absent femoral pulses requires immediate senior review) including rate and regularity
- assessment of the precordial impulse for heave or thrill, displaced apex beat
- auscultation for normal heart sounds and murmur
predictors of congenital heart disease – harsh quality, location (not LLSE) and timing (diastolic, continuous)³
- review of the respiratory system and of liver size to assess for signs of cardiac failure (although rare in the newborn)

CARDIAC MURMURS MANAGEMENT

Murmurs are common in neonates (2-4%), and often resolve over the first few days of life.¹ Approximately 50% of murmurs are pathological with the most common neonatal murmur being pulmonary branch stenosis which usually resolves during the first few months of life.⁴

1. **Oximetry** should be applied immediately to any baby noted to have a murmur. The presence of central cyanosis or hypoxaemia ($\text{SaO}_2 < 90\%$) require immediate review by a Paediatric consultant or senior registrar and admission to SCN for further management. Measuring oximetry in the upper limbs and lower limbs is essential as differential sats ($> 5\%$) may suggest ductal dependent lesions such as arch obstruction, even in the absence of typical signs (murmur, diminished or absent femoral pulses, acidosis).

2. **ECG:** There is minimal benefit from performing an ECG's in the diagnosis of a murmur^{5, 6, 7, 8, 9}. This may be done on a case by case basis at the request of a senior doctor. An ECG with rhythm strip should be performed in all cases where rhythm disturbance is suspected.
3. **CXR:** Most studies show no benefit in diagnosis of murmur^{6, 7, 8, 9} and as such, is not part of the routine assessment of a child with a murmur. A CXR can be useful in a symptomatic neonate to exclude respiratory disease and will be performed in such situations.
4. **Echocardiogram:** An echocardiogram is the gold standard investigation for investigation of structural cardiac disease when performed by an expert in the field. At KEMH, all children presenting with a murmur with a suspicion of congenital heart defect should be referred to the Senior Registrar/Consultant Neonatologist at KEMH. The Senior Registrar/Consultant Neonatologist can then discuss the child with the On call Paediatric Cardiologist at Princess Margaret Hospital regarding appropriate management, which may include echocardiography.

Most murmurs, with normal oximetry (SaO₂ ≥95%) and no abnormal clinical signs, do not require urgent referral and echocardiography. If the murmur is loud, oximetry is abnormal, or there are other signs (abnormal HS, thrill) then echocardiography may be performed prior to discharge from KEMH (at the discretion of the on-call Paediatric Cardiologist) or arrangements made for a Paediatric Cardiology outpatient clinic appointment within one month. Any baby with cyanosis, shock, failure or absent femoral pulses should be transferred to SCN and urgent Paediatric Cardiology referral requested.

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