

The Infant with a Murmur Guideline

**Murmur identified in infant
 (discharge check - 6 weeks)**

Detailed History, Examination and Vital Signs (RR and pre/post duct SpO2)

RED FLAGS - Any of the following:

- Signs of heart failure
- Signs of shock
- Cyanosis (SpO2 <94%) or > difference in pre + post ductal saturations
- Absent/ weak femoral pulses
- >20mmHg difference in systolic BP between UL + LL
- Abnormal anatomy scan and any genetic diagnosis associated with congenital heart disease as

URGENT

- Admit
- Perform ECG, CXR, blood gas, 4 limb BP
- Contact Consultant on call CHI at Crumlin
- Contact NNTP

YELLOW FLAGS:

- Dysmorphic features
- Feeding symptoms or FTT
- Increased precordial activity
- Harsh sounding, ejection systolic/ pansystolic/ diastolic murmur

SOON

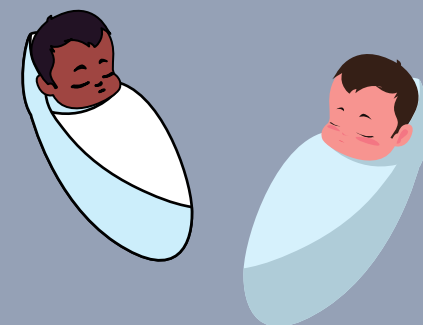
- Perform ECG
- Contact Cardiology Registrar on Call CHI at Crumlin
- Referral using infant murmur proforma
- Early OPD review (1-2 weeks)
- Red flag advice to parents

GREEN FLAGS

- Well baby
- Feeding well with no FTT
- No signs of heart failure or shock
- Normal vital signs
- Soft systolic murmur
- Easily palpable femoral pulses

ROUTINE

- Red flag advice to parents**
- Review in a local paediatric clinic at 6/52 of age
 - If local consultant innocent murmur, no further action required; routine referral to cardiology OPD if any concerns

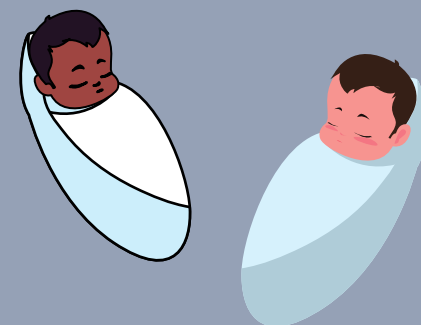


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Background information

- Congenital heart disease occurs in approximately 8 in every 1,000 live births in Europe (1) (2)
- Overall prenatal screening in Ireland detects 58% of critical congenital heart disease (duct dependent lesions and obstructed total anomalous pulmonary venous drainage); the detection rate is >70% when there is a routine 20 week anomaly scan provided (3)
- Approximately 2% of neonates will be noted to have a murmur on routine postnatal examination (4)
- Repeated studies have shown that the seniority of the person examining the infant is important in differentiating between murmurs that are likely to be significant versus those likely to be innocent therefore it is important that all infants with a murmur are examined by a consultant prior to discharge (4) (5)
- A variety of investigations are used by different institutions to evaluate murmurs in a neonate including four-limb blood pressure, electrocardiogram, chest x-ray and echocardiogram
- Echocardiography is the gold-standard investigation for evaluating a murmur
- Four-limb blood pressure has not been shown to be helpful in confirming or excluding coarctation of the aorta in asymptomatic neonates (6)
- The chest x-ray is of limited value in neonates who are asymptomatic with a cardiac murmur even when reported by experienced radiologists (7)
- There are no studies examining the usefulness of electrocardiogram in asymptomatic neonates with a murmur

All infants with a heart murmur on neonatal examination should be reviewed locally by a consultant and should remain in hospital at least until over 24 hours of age



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References

1. Wren C, Reinhardt Z, Khawaja K. Twenty-year trends in the diagnosis of life threatening neonatal cardiovascular malformations. *Arch Dis Child Fetal Neonatal Ed.* 2008;93:F33-F35.
2. Dolk H, Loane M, Garne E. Congenital Heart Defects in Europe: Prevalence and Perinatal Mortality 2000 – 2005. *Circulation* 2011;123:841-849.
3. Lynch A, Ng L, Lawlor P, Lavelle M, Gardner F, Breatnach C, McMahon CJ, Franklin O. Cyanotic Congenital Heart Disease Modes of Presentation and Prenatal Detection. *Ir Med J* 2019; 112(10): P1019.
4. Azhar AS, Habib HS (2006) Accuracy of the initial evaluation of heart murmurs in neonates: do we need an echocardiogram? *Pediatr Cardiol* 27(2):234–237.
5. Karatza AA, Fouzas S, Tzifas S, Mermiga A, Dimitriou G, Mantagos S. Accuracy of cardiac auscultation in asymptomatic neonates with heart murmurs: comparison between paediatric trainees and neonatologists. *Paediatr Cardiol* 2011; 32(4):473-7.
6. Crossland DS, Furness JC, Abu-Harb M, Sadagopan SN, Wren C. Variability of four limb blood pressure in normal neonates. *Arch Dis Child Fetal Neonatal Ed* 2004; 89(4):F325-7.
7. Oeppen RS, Fairhurst JJ, Argent JD. Diagnostic Value of the Chest Radiograph in Asymptomatic Neonates with a Cardiac Murmur. *Clinical Radiology* 2002;57(8):736-740.