

Approach to the neonate with a heart murmur

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Introduction:

- Heart murmurs are common in infants and children. The most common reason for a referral to a pediatric cardiologist is to evaluate a murmur.
- While the prevalence of congenital heart disease is approximately 1%, the majority of children have innocent murmurs at some point in their lives.
- It is critical for diagnosis and management to be able to distinguish a murmur caused by heart disease from one caused by a benign etiology.

The investigation of the neonate with a heart murmur:

- Investigation will vary depending upon local resources and expertise. The following recommendations represent the minimum requirements to ensure the safe management of neonates with heart murmurs and the timely identification of congenital heart disease.
- All infants with a heart murmur should remain in hospital until >24 hours old (unless definitive diagnosis is reached before this).
- All infant with a heart murmur should have a detailed cardiovascular clinical examination which must include measurement of pre and post ductal saturations.
- If a baby with a heart murmur is discharged before a definitive diagnosis is reached, the parents should be given a written information leaflet describing warning signs and advising them of what to do if their baby became unwell

Clinical examination:

- Dysmorphic features
- Signs of heart failure (tachypnoea, increased respiratory effort, hepatomegaly, shock)
- Palpation of brachial and femoral pulses

- Presence of cyanosis (as measured by lower limb saturations – a reading $< 96\%$ or $> 3\%$ difference between pre and post ductal saturations should prompt further investigation 1)
- Heart sounds
- Presence of a heave
- Murmur – intensity, character, location and radiation

Electrocardiogram:

- ECG has been shown to be a sensitive and specific tool for diagnosing atrioventricular septal defect but has not been shown to aid significantly in the diagnosis of other structural congenital heart disease.
- It is not necessary to perform an ECG as part of the routine assessment of a baby with a heart murmur.
- A normal neonatal ECG shows right axis deviation because of the right ventricular dominance of the newborn heart. Left axis deviation in a newborn is a significant abnormal finding and should prompt further investigation.
- A normal ECG should not be considered reassuring if there are abnormal clinical findings or lower limb saturations $< 96\%$.

CXR and 4 limb blood pressure

- There is no evidence to support the use of CXR or 4 limb blood pressure measurements in the assessment of neonates with heart murmurs.

Echocardiography

- This is the gold standard investigation for differentiating between innocent and pathological murmurs. Some units will undertake an echocardiogram in all neonates with heart murmurs. For many units this is not currently practical.
- In units where it is not feasible to perform echocardiogram for all infants with heart murmurs, information gathered from examination findings and oxygen saturations can be used to determine the need for and timing of echocardiography and follow up:

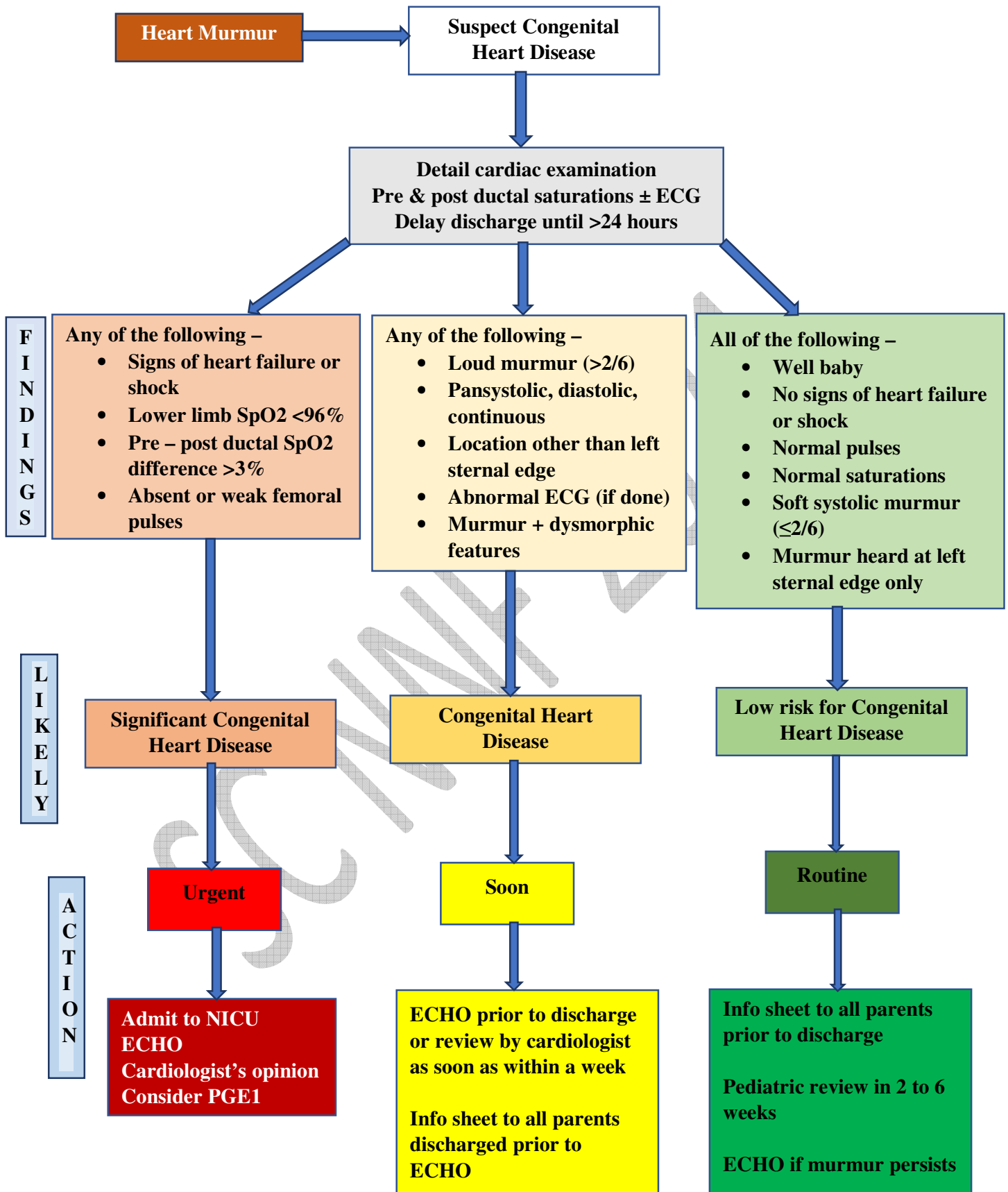


Fig. 1. Flow chart depicting approach to the neonate with a heart murmur

Summary:

- *A heart murmur heard in the neonatal period may be associated with congenital heart disease.*
- *However, it must be remembered that not all infants with congenital heart disease have a heart murmur in the neonatal period.*
- *A neonate with any of the following findings needs urgent assessment including echocardiogram even if a murmur is not present: signs of heart failure or shock (see below), lower limb saturations <96% in the absence of respiratory disease, >3% difference between pre and post ductal saturations, absent/weak femoral pulses.*

References:

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