

MCN for Neonatology

West of Scotland

Neonatal Guideline



Heart Murmurs in the Neonate

An approach to the neonate with a heart murmur

This guideline is applicable to medical and nursing staff caring for neonates in the West of Scotland.

Introduction

- 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.

The investigation of the neonate with a heart murmur (see attached flowchart)

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 on neonatal examination should be reviewed by a senior paediatrician (middle grade or consultant).
- 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 in the event that 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 defect² (more common in infants with Trisomy 21) but has not been shown to aid significantly in the diagnosis of other structural congenital heart disease ³. It is not necessary to perform an ECG as part of the routine assessment of a baby with a heart murmur.
- If performed, 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.
- Whilst an abnormal ECG 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 ^{3,4,5,6}.

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:

1. Likely significant congenital heart disease –urgent echocardiogram and review (same day)

Infants with a heart murmur and **any** of the following warning signs: lower limb saturations < 96%; >3% pre / post ductal difference; absent/weak femoral pulses; signs of heart failure or shock. These infants require admission to a neonatal unit for consideration of prostaglandin and urgent discussion +/- transfer to a cardiac centre. If appropriately skilled local PEC or visiting cardiologist is available to perform echocardiogram while retrieval is awaited then this can be linked by telemedicine link / used to update surgical centre. **This should not be allowed to delay transfer.**

2. Asymptomatic but clinically pathological murmur – soon echocardiogram (pre-discharge or as soon as possible within 1 week)

Infants without any of the above warning signs but with **any** of the following abnormal clinical findings: dysmorphism; heave; abnormal heart sounds; loud murmur (>2/6); pansystolic, diastolic, continuous murmur; murmur location other than left sternal edge/radiation.

3. Low risk of congenital heart disease - routine review neonatal OPC 2-6 weeks

Well infants with no signs of heart failure, normal pulses, lower limb saturations >96%, soft (1-2/6) systolic murmur at the left sternal edge with no radiation.

References

- **1. Impact of pulse oximetry screening on the detection of duct dependent congenital heart disease: a Swedish prospective screening study in 39 821 newborns.** Anne de Wahl Granelli et al *BMJ* 2009; 338;a3037
- **2. Neonatal ECG screening for congenital heart disease in Down syndrome.** Narchi H *Ann Trop Paediatr* 1999; 19:51-4
- **3. Can Cardiologists Distinguish Innocent from Pathologic Murmurs in Neonates?** Andrew S Mackie et al *The Journal of Pediatrics* 2009; 154:50-4
- **4. Diagnostic value of chest radiography and electrocardiography in the evaluation of asymptomatic children with a cardiac murmur.** Birkebaek NH, Hansen LK, Oxhøj H *Acta Paediatr.* 1995 Dec; 84(12): 1379-81
- **5. Noninvasive tests in the initial evaluation of heart murmurs in children.** Newburger JW, Rosenthal A, Williams RG, Fellows K, Mettinien OS. *N Engl J Med.* 1983 Jan 13; 308(2); 61-4
- **6. Variability of four limb blood pressure in normal neonates.** D S Crossland, J C Furness, M Abu-Harb, S N Sadagopan, C Wren *Arch Dis Child Fetal Neonatal Ed* 2004; 89:F325-F327



Based on the PECSIG 2013 guideline

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Guideline Name

WoS_Murmurs_Neonates

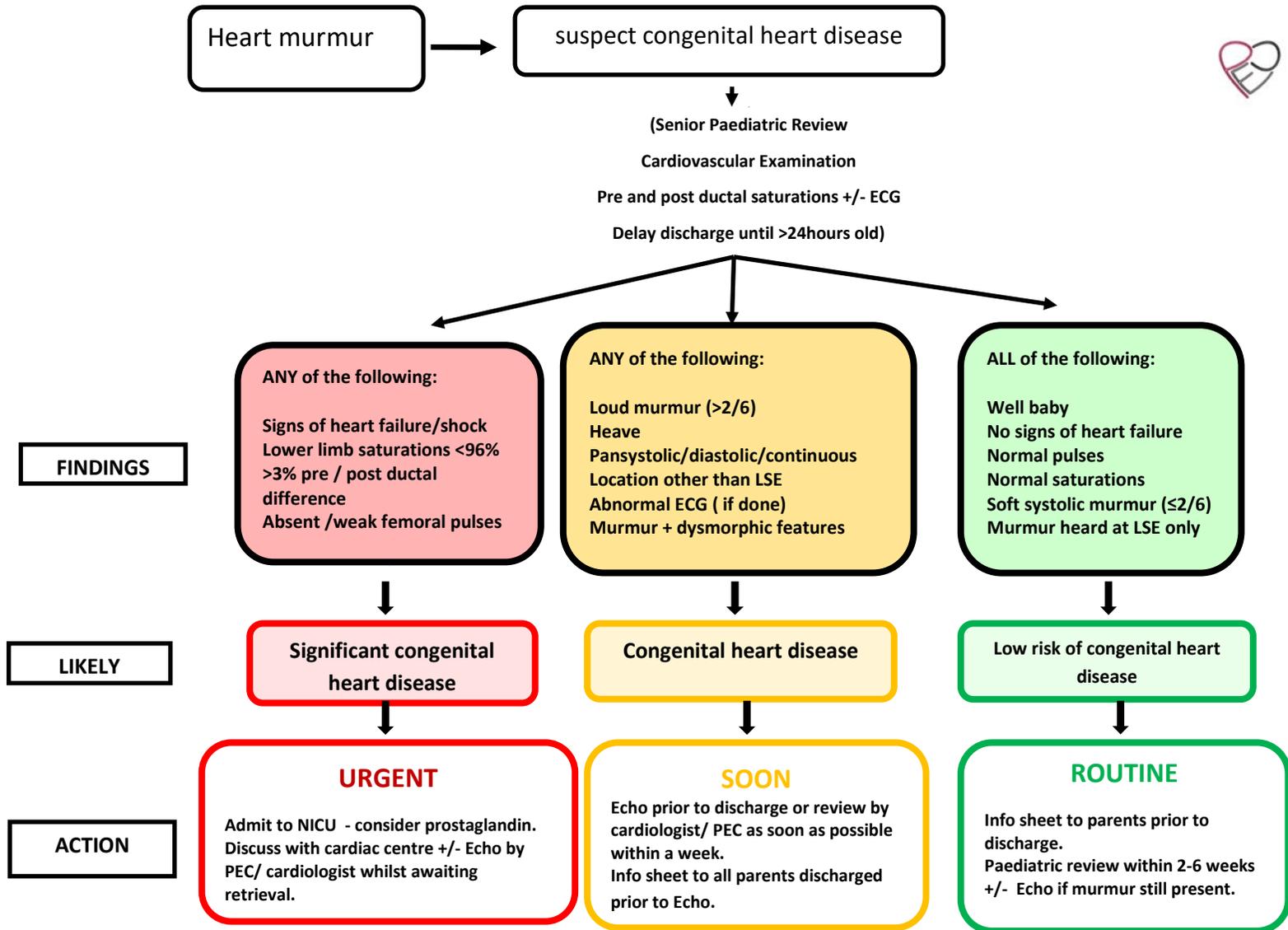
Implementation / Review Dates

Implementation Date – 05/02/14 Reviewed – 08/12/21 Next Review Date - 01/12/2024

Appendices

1. Flow Chart
2. Parental Information Sheet

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HEART MURMURS IN THE NEWBORN

INFORMATION FOR PARENTS

What is a heart murmur?

A heart murmur is an extra noise which is heard when the heart is listened to with a stethoscope.

Does a heart murmur mean there is heart problem?

No. Most babies with heart murmurs have completely normal hearts. These babies have what are known as “innocent” or “normal” heart murmurs. However, sometimes a heart murmur can be a sign that there is a problem with the heart like a small hole or a narrowing and this is why all babies with heart murmurs are reviewed.

How will I know if my baby has a heart problem?

Your baby will be seen in clinic within 2-6 weeks. If the murmur can still be heard and the doctor is not sure that it is an “innocent” or “normal” heart murmur then your baby will be referred to a heart specialist who may do further tests.

What should I look out for?

Most babies with heart murmurs remain well but if your baby becomes unwell they should be seen urgently by a doctor. Signs to look out for include: breathing difficulties; breathless or sweaty when feeding; poor feeding; blue colour of skin and lips or mottled skin.

What should I do if my baby becomes unwell?

You should seek urgent medical advice. Phone _____ . Explain that your baby has a heart murmur and has become unwell.

Points to remember

A heart murmur is an extra noise heard when listening with a stethoscope.

Most babies with heart murmurs have completely normal hearts.

A heart murmur can sometimes be a sign of an underlying heart problem.

IF YOUR BABY BECOMES UNWELL SEEK URGENT MEDICAL ADVICE.

