

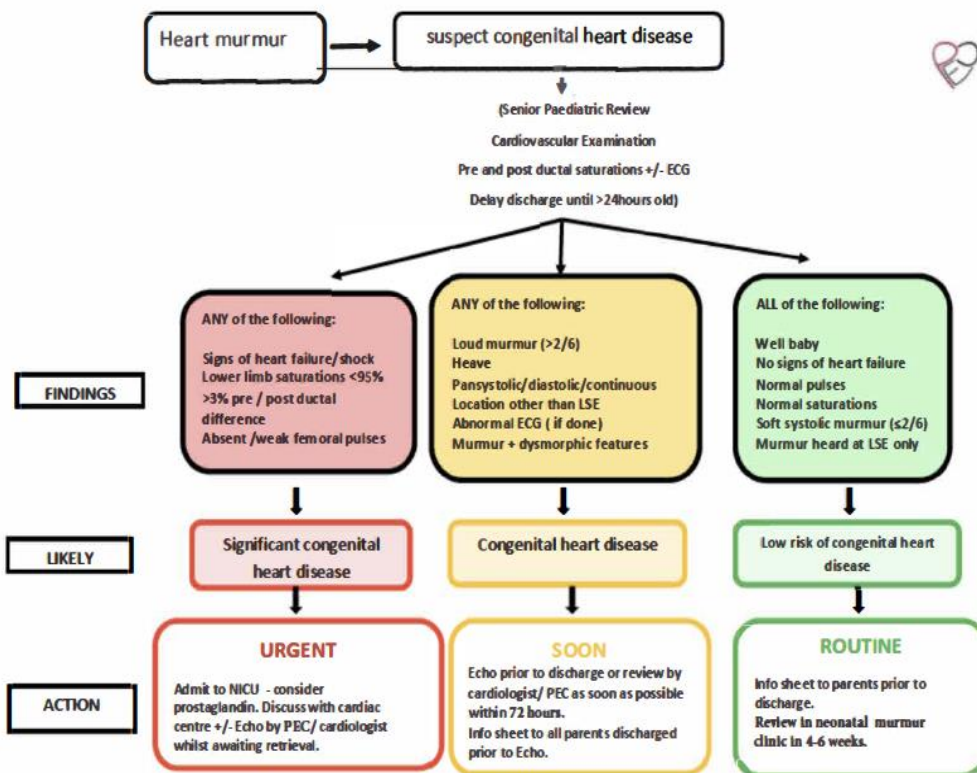
NEONATAL HEART MURMURS

ASSESSMENT OF A NEONATE WITH A HEART MURMUR

TARGET AUDIENCE	Neonatal and Maternity Services in NHS Lanarkshire
PATIENT GROUP	Neonatal patients within NHS Lanarkshire

Clinical Guidelines Summary

Neonatal Murmurs Flowchart



Neonatal Heart Murmurs

Introduction

A heart murmur heard in the neonatal period may be associated with congenital heart disease (CHD). However, it must be remembered that not all neonates with congenital heart disease have a heart murmur in the neonatal period.

A neonate with ANY of the following findings needs urgent senior (neonatal tier 2 or consultant) assessment including echocardiogram even if a murmur is not present:

- Signs of heart failure or shock (see below)
- Lower limb saturations <95% in the absence of respiratory disease
- >3% difference between pre and post ductal saturations
- Absent/weak femoral pulses

Work up of the neonate with a heart murmur

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 neonates with a heart murmur on neonatal examination should be reviewed by a senior neonatologist (neonatal tier 2 medical staff or consultant)
- All neonates with a heart murmur should remain in hospital until >24 hours old to be reviewed later (unless definitive diagnosis is reached before this)
- If a murmur persists > 24 hours, a member of the neonatal tier 2 medical team or consultant should review the murmur before discharge
- All neonates with a heart murmur should have a detailed cardiovascular clinical examination which must include auscultation of heart sounds, measurement of pre and post ductal saturations and palpation of femoral pulses
- Echocardiogram is the gold standard to differentiate between innocent & pathological murmur
- If a baby with a heart murmur on the **green pathway** 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
- Although not routine, due to a lack of evidence supporting routine use in the assessment of neonates with heart murmurs, chest x-ray and 4-limb blood pressure measurements can be considered by the clinical team

When assessing the clinical significance of a heart murmur heard in a neonate, the following should also be considered.

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History & Risk Factors

- **Family history:** one previous sibling with CHD increases the recurrence risk to 2%, two previous siblings increase the risk to 10%
- **Maternal Diabetes:** increased risk to 2-3%
- **Other fetal anomalies:** on prenatal screening, including malformations of other systems, fetal arrhythmias and non-immune hydrops
- **Syndromes:** CHD is common in most chromosomal abnormalities and in many other non-chromosomal syndromes, including fetal alcohol syndrome and congenital infections such as rubella
- **Down Syndrome:** 35-45% of children with Down syndrome will have CHD. Please refer Down syndrome care pathways for recommended assessment in these neonates.

Examination

- **Colour:** oxygen saturations have to be below 80% before cyanosis becomes clinically obvious. If O₂ saturations < 96% in any of lower limbs in the absence of respiratory disease, then that should be considered as abnormal
- **Assessment of peripheral pulses:** particularly femoral pulses
- **Assessment of precordial impulses:** many major CHD lesions will produce an increased right and/or left ventricular load well before a murmur appears. Therefore, an easily palpable or visible precordial impulse in a quiet baby is a sign of possible CHD.
- **Signs of heart failure:** including tachypnoea, increased respiratory effort, hepatomegaly, poor capillary refill, shock
- **Murmurs:** the following criteria are helpful in differentiating between an innocent (non-pathological) and significant murmur

❖ Features suggestive of innocent neonatal murmurs

- The murmur is grade 1-2/6 and heard at the left sternal edge without radiation
- There are no audible clicks
- The pulses are normal
- Normal pre & post-ductal saturations
- Baby is otherwise well

❖ Suspicious features include:

- Murmur grade 3/6 or more, radiating to the back or neck
- Palpable heave or thrill
- Pansystolic murmur
- Murmur extending into diastole
- Harsh quality
- Abnormal second heart sound
- Early or mid-systolic click

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Outcome

Following diligent clinical assessment as detailed above, the following outcomes can be considered, as summarised on the flow chart **on the cover page**.

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

Neonates with a heart murmur and any of the following warning signs: lower limb saturations < 95%; >3% pre / post ductal difference; absent/weak femoral pulses; signs of heart failure or shock. These neonates require admission to a neonatal unit for consideration of prostaglandin and urgent discussion +/- transfer to a cardiac centre. Refer to WOS postnatal pathway for suspected/detected congenital heart disease.

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

Neonates 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. Please discuss with neonatal team at UHW if echocardiogram could be arranged locally or paediatric cardiology registrar at Royal Hospital for Children Glasgow, for urgent outpatient review if local echocardiography is not feasible.

3. Low risk of congenital heart disease – routine Neonatal Murmur Outpatient Clinic in 4-6 weeks

These neonates will have no signs of heart failure, normal pulses, lower limb saturations >95%, soft (1-2/6) systolic murmur at the left sternal edge with no radiation. These neonates could be discharged home with an information leaflet given to parents. This should be arranged through a Maternity Badger Neonatal Consultant Outpatient Referral, for a review in 4-6 weeks. **It should be specified in the referral that the baby should attend the Neonatal Murmur clinic to ensure the baby is appropriately allocated to Dr Montasser or Dr Gopalakrishnan's Neonatal Murmur Clinic.**

Please note that Dr Montasser, Dr Gopalakrishnan and Dr Bilkhu will be available to scan neonates with suspected pathological murmurs before discharge if required as a first point of contact. If they are not available, discuss with Dr Keir Greenhalgh or Paediatric Cardiology at Royal Hospital for Children Glasgow if an urgent echocardiogram is required.

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References

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7. **Heart murmurs in the neonate.** O'Reilly K et al. West of Scotland Neonatal Guideline. Available from: https://perinatalnetwork.scot/wp-content/uploads/2022/06/Heart-Murmurs-in-the-Neonate_WoS.pdf

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Appendix 1: Patient Information Leaflet



Heart Murmurs in Newborn Babies



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?

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 999**.
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 will have normal hearts**
- **A heart murmur can sometimes be the sign of an underlying problem with the heart**
- **If your baby becomes unwell, seek urgent medical advice**

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1. Governance information for Guidance document

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CHANGE RECORD

Date	Lead Author	Change	Version
		<i>e.g. Review, revise and update of policy in line with contemporary professional structures and practice</i>	1
			2
			3
			4
			5

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