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.

Summary of Changes in May 2026 Review	
Page 2	Insertion of paragraph highlighting routine pulse oximetry screening in all newborn babies.
Page 1-3	Parameters for further investigation adjusted to bring into line with GG&C guidance on routine pulse oximetry screening in newborns.

Introduction

- A heart murmur heard in the neonatal period may represent an innocent flow murmur from branch pulmonary arteries, be associated with transitional circulation (closing PDA), or 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 senior Paediatrician or Neonatologist (Resident middle grade or Consultant) assessment 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,
    - failed newborn pulse oximetry screening,
    - 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 paediatric middle grade doctor or consultant.
- All infants with a heart murmur should remain in hospital until >24 hours old (unless definitive diagnosis is reached before this).
- All infants 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 (Appendix 2) describing warning signs and advising

them of what to do in the event that their baby became unwell. Ensure an appropriate contact telephone number is given to parents e.g. the phone number for their local neonatal unit.

Clinical examination:

- Dysmorphic features
- Signs of heart failure (tachypnoea, increased respiratory effort, hepatomegaly, shock)
- Palpation of brachial and femoral pulses
- Presence of cyanosis
- Heart sounds
- Murmur – intensity, character, location and radiation

Routine Pulse Oximetry Screening

- As per the NHS Greater Glasgow & Clyde guidance for postnatal saturation screening, a pre or postductal saturation reading of less than 95% **OR** a difference of greater than or equal to 3% between pre and postductal saturations warrants further investigation.[1]

Electrocardiogram

- ECG has been shown to be a sensitive and specific tool for diagnosing atrioventicular septal defect[2] (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 <95%.

CXR and 4 limb blood pressure

There is no evidence to support the routine 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 specialist investigation (undertaken by Paediatrician with Expertise in Cardiology (PEC), Paediatric Cardiologist or Cardiac Physiologist qualified to perform congenital Echocardiography) for differentiating between innocent and pathological murmurs. In neonatal units without the specialist expertise to undertake congenital echocardiography on site, information gathered from examination findings and oxygen saturations should be used to determine the need for and timing of follow up +/- referral to paediatric cardiology services.

Neonatologist Performed Echocardiography (NPE) is an important diagnostic tool but should not be used as a substitute for congenital Echocardiography, and clinical criteria for referral to Cardiology should be applied even if NPE findings are reassuring.

1. Likely significant congenital heart disease –urgent NICU admission

Infants with a heart murmur and **any** of the following warning signs: failed newborn pulse oximetry screening; absent/weak femoral pulses; signs of heart failure or shock. These infants require immediate 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 congenital echocardiogram while retrieval is awaited then this can be done to inform immediate management. **This should not delay transfer.**

2. Asymptomatic but pathological murmur – soon congenital echocardiogram (pre-discharge or as an urgent outpatient appointment)

Infants without any of the above warning signs but with **any** of the following abnormal clinical findings: dysmorphism; abnormal heart sounds; loud murmur (≥3/6); pansystolic, diastolic, continuous murmur; murmur location other than left sternal edge/radiation.

3. Low risk of congenital heart disease - routine review neonatal OPC 4-6 weeks

Well infants with no signs of heart failure, normal pulses, baby passed routine pulse oximetry screening (i.e. a saturation reading of 95% or above in both limbs or a difference of less than 3% between pre and post ductal saturations), soft (1-2/6) systolic murmur at the left sternal edge with no radiation.

References

- 1. MacLaren A, Raeside L. NHS Greater Glasgow & Clyde guideline for Newborn Pulse Oximetry Screening. Last review – Jan 2026.Newborn pulse oximetry screening | NHSGGC
- 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, Oxhoj 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

Authors - PECSIG Neonatal Murmur Guideline Group

(Kathleen O'Reilly, Hilary Maddicks, Vishna Rasiah, Venu Gopalan with BCCA input from Rob Martin and John Simpson)

Adapted and updated for local use by

Dr Kathleen O'Reilly – Consultant Neonatologist, RHC, Glasgow

Dr Maria Ilina – Consultant Cardiologist, RHC, Glasgow

Guideline Name

WoS_Murmurs_Neonates

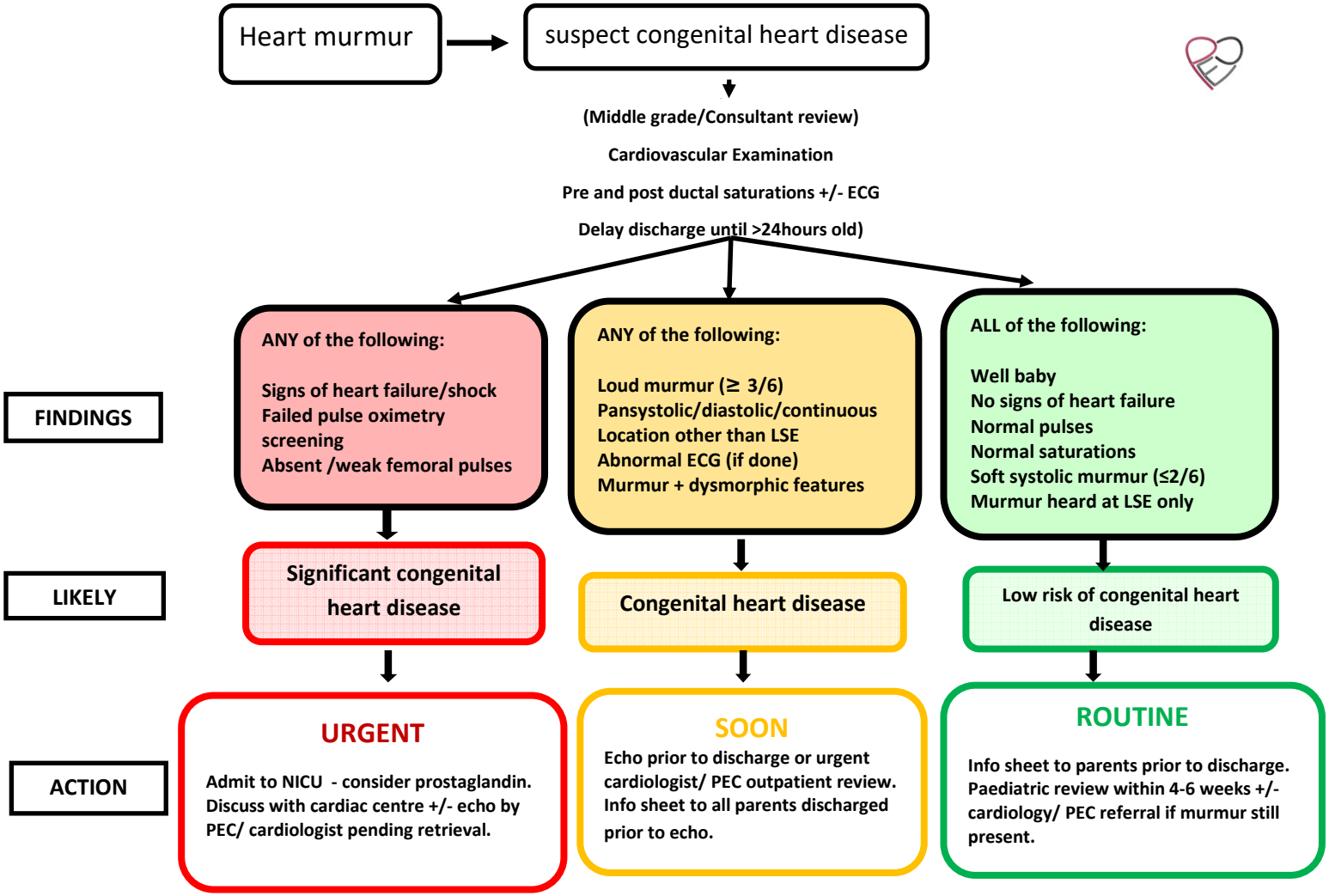
Implementation / Review Dates

Implementation Date – 05/02/14 Reviewed – 21/05/2026 Next Review date 01/06/2029

Appendices

1. Flow Chart
2. Parental Information Sheet

West of Scotland Neonatal Murmur Guideline



HEART MURMURS IN THE NEWBORN

INFORMATION FOR PARENTS

What is a heart murmur?

A heart murmur is an extra whooshing 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 neonatal clinic within 4-6 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.