Ashford and St. Peter's Hospitals
NHS Foundation Trust

ASSESSMENT OF PAEDIATRIC MURMURS

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Guideline History		
Date	**Comments**	**Approved By**
June 2020	Last updated	
Dec 2023	Addition of pathological murmur table	Paediatric Guideline Committee

Contents

Page

1. Guideline
    a. Introduction
    b. Evaluation
    c. Algorithm for evaluation of newborn murmurs
    d. Algorithm for evaluation of older children murmurs
    e. Characterisation of innocent murmurs
    f. Characterisation of pathological murmurs
2. Supporting References
3. Supporting Trust Guidelines
4. Guideline Governance
    a. Scope
    b. Purpose
    c. Duties and Responsibilities
    d. Approval and Ratification
    e. Dissemination and Implementation
    f. Review and Revision Arrangements
    g. Equality Impact Assessment
    h. Document Checklist
5. Appendices

Title of Guideline

Evaluation of Paediatric murmurs

Introduction

Heart murmurs are common in asymptomatic and otherwise well children (Innocent murmur). A murmur can also be the sole manifestation of structural heart disease (pathologic murmur). A careful evaluation is essential to separate these scenarios.

Evaluation

Historical elements and symptoms suggestive of pathology

Antenatal history – in utero exposure to medications and alcohol, maternal diabetes mellitus, ultrasound screening done and findings.

Family history of sudden cardiac death or congenital heart disease.

History of rheumatic fever or Kawasaki disease and certain genetic disorders

Symptoms of cardiac failure – feeding difficulties, exercise intolerance, respiratory difficulties etc.

Chest pain, palpitations, exertional syncope.

Physical examination

Deranged age specific vital signs, especially pre and post ductal saturations in peri-neonatal infants

Features of heart failure – poor activity level, pallor, respiratory distress, prominent neck vessels, abnormal pulsations, abnormal cardiac impulses, thrills. Signs of lung congestion and abdominal organomegaly.

Innocent Murmurs –

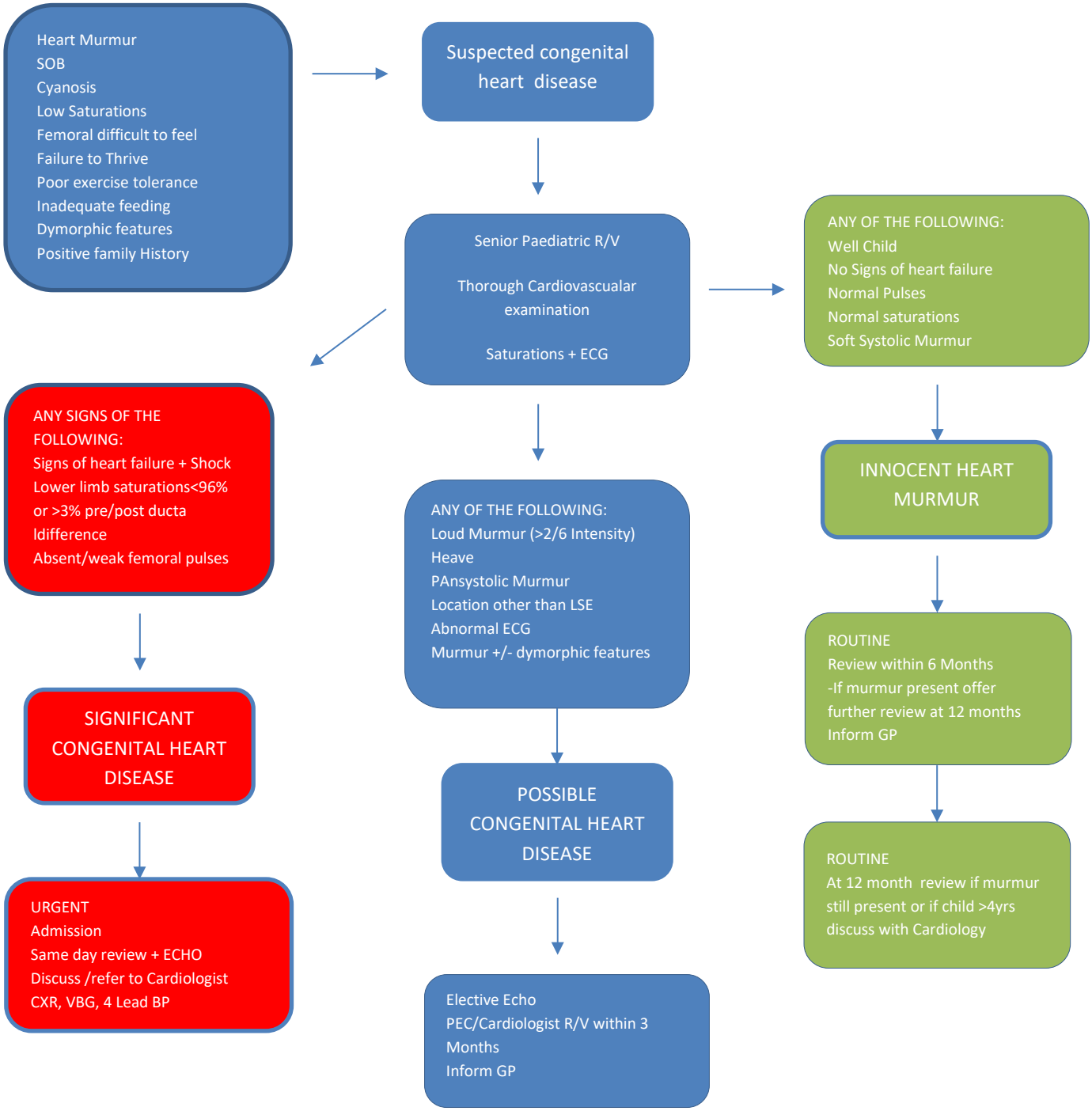
- Sensitive (changes with child's position or with respiration)
- Short duration (not holosystolic)
- Single (no associated clicks or gallops)
- Small (murmur limited to a small area and not radiating)
- Soft (low amplitude)
- Sweet (not harsh sounding)
- Systolic (occurs and is limited to systole)
- Murmur with fever

Pathological murmurs –

- Holosystolic (pansystolic) murmur
- Harsh murmur
- Abnormal heart sounds
- Early or mid-systolic click
- Grade 3 murmur or greater
- Heard over upper left sternal border
- Diastolic murmurs

Algorithm for evaluation of newborn murmurs

Algorithm for evaluation of murmurs in older children



Characterisation of Innocent Heart murmurs

Type	Description	Age at detection	Differential
Still's murmur	Grade 1 to 3, early systolic murmur; low to medium pitch with a vibratory or musical quality; best heard at lower left sternal border; loudest when patient is supine and decreases when patient stands.	Infancy to adolescence, often 2 – 6 years	VSD or Hypertrophic cardiomyopathy
Pulmonary flow murmur	Grade 2 o 3, crescendo-decrescendo, early- to mid-systolic murmur peaking in mid-systole; best heard at the left sternal border between the second and third intercostal spaces; characterised by a rough, dissonant quality; loudest when patient is supine and decreases when patient is upright and holding breath	All	ASD or pulmonary valve stenosis
Venous hum	Grade 1 to 6 continuous murmur; accentuated in diastole; has a whining, roaring or whirring quality; best heard over low anterior neck, lateral to the sternocleidomastoid; louder on right; resolves or changes when patient is supine	3 to 8 years	PDA or Cervical arteriovenous fistulas
Peripheral pulmonary stenosis	Grade 1 or 2 , low- pitched, early- to mid-systolic ejection murmur heard over axilla or back	< 1 year; often heard in premature infants, LBWs, and infants up to 4 months of age	Pulmonary artery stenosis
Supraclavicular/ brachiocephalic systolic murmur	Brief, low-pitched, crescendo –decrescendo murmur heard in the first two-thirds of systole; best heard above clavicles; radiates to neck; diminishes when patient hyperextends shoulders	Childhood to young adulthood	Bicuspid/stenotic aortic valve, pulmonary valve stenosis, or coarctation of the aorta
Aortic systolic murmur	Systolic ejection murmur best heard over the aortic valve	Older children into adulthood	-

Characterisation of Pathological Heart murmurs

Type	Description	Age at detection	Associated symptoms
Ventricular Septal Defect	Loud Holosystolic Murmur at left lower sternal border, with associated thrills	0-1	Usually asymptomatic in small defects Large defects: CHF, frequent respiratory infections
Atrial Septal defect	Grade 2/3 systolic ejection murmur hear at upper left sternal border	0-1	Usually asymptomatic
Patent Ductus arteriosus	Continuous grade 1-5 murmur in upper left sternal border	First week of life	May be asymptomatic can cause easy fatigueablity
Tetralogy of Fallot	Central cyanosis, nail clubbing, Grade 3-4 long ejection systolic mumur heard at upper left sternal border	2-6 months or in childhood	Cyanosis, decreased exercise tolerane
Pulmonary stenosis	Grade 2-5 ejection systolic murmur at upper left sternal border radiating to axila, infraclavicular region		Usually asymptomatic but can cause pulmonary congestion
Coarctation of the aorta	Systolic ejection murmur best heard over interscapular region, decreased or delayed femoral pulses	Newborns - Childhood	Signs of congestive heart failure, Leg pain or weakness in older children
Aortic Stenosis	Systolic ejection murmur best heard upper sternal border with radiation to carotid arteries, thrill	Newborns - infants	Dyspnea, syncope, signs of congestive heart failure

	at upper left sternal border		
Transposition of the great arteries	Murmur maybe absent or grade 1-2 nonspecific systolic murmur	First week of life	Cyanosis, signs of congestive heart failure, Nail clubbing
Total anomalous pulmonary venous connection	Grade 2-3 ejection systolic ejection at mumur at upper left sternal border, mid diastolic flow at lower sternal border	4 – 6 weeks of life	Signs of congestive heart failure
Tricuspid atresia	Holosystolic murmur at lower left sternal border, mid diastolic flow murmur at apex	First month of life	Early onset cyanosis, nail clubbing
Trncus arteriosus	Holosystolic murmur, mid diastolic rumble	First few weeks of life	Signs of congestive heart failure

2. Supporting References

Frank JE, Jacobe KM; Evaluation and Management of heart murmurs in children, *Am Fam Physician*. 2011 Oct 184(7): 793-800.

Park MK: Pediatric Cardiology for Practitioners, 5th Edition, Mosby Elsevier. 2008

Venugopalan P, Ranaweera M, Paedatric murmur guideline for the children's emergency department, *Arch Dis Child* 2015; 100(Suppl 3): A38 – A39.

Punnoose AR, Burke AE, Golub RM. Innocent (Harmless) Heart Murmurs in Children. *JAMA*.2012;308(3):305. doi:10.1001/jama.2012.6223

Heart Murmurs in Children; Patient Info, Dec 2020

3. Supporting relevant trust guidelines

Venugopalan P, Hughes E; Paediatric heart murmurs, Paediatric Clinical Practice Guidelines, Brighton and Sussex university Hospitals

Hendry S, Smith B, Kendrew-Jones T; Incidental Murmur, NHSGGC Paediatrics for Health professionals

4. Guideline Governance

a. Scope

This guideline is relevant to all staff caring for all children from 0-18 years old across the emergency department, inpatient ward and outpatient department.

b. Purpose

i. This guidelines aims to facilitate a common approach to the management of children. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

c. Duties and Responsibilities

All healthcare professionals responsible for the care of all children 0-18years should be aware of practice according to this guideline.

d. Approval and Ratification

This guideline will be approved and ratified by the Paediatric Guidelines Group.

e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Paediatric Guidelines' page and thus available for common use.
ii. This guideline will be shared as part of ongoing education within the Paediatric Department for both medical and nursing staff.
iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

f. Review and Revision Arrangements

a. This policy will be reviewed on a 3 yearly basis by the appropriate persons.
b. If new information comes to light prior to the review date, an earlier review will be prompted.
c. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Paediatric Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

g. Equality Impact Assessment

Background • Who was involved in the Equality Impact Assessment
Dr Groves
Methodology • A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age) • The data sources and any other information used • The consultation that was carried out (who, why and how?)
All groups of staff and patients were taken into consideration and there is no bias towards or against any particular group.
Key Findings • Describe the results of the assessment • Identify if there is adverse or a potentially adverse impacts for any equalities groups
There is no evidence of discrimination.
Conclusion • Provide a summary of the overall conclusions
There is no evidence of discrimination.
Recommendations • State recommended changes to the proposed policy as a result of the impact assessment • Where it has not been possible to amend the policy, provide the detail of any actions that have been identified • Describe the plans for reviewing the assessment
This guideline is appropriate for use.

h. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

Title of the document: Assessment of Paediatric Murmurs

Policy (document) Author: Dr Toni Ajoje

Executive Director: N/A

		Yes/No/ Unsure/NA	Comments
1.	**Title**		
	Is the title clear and unambiguous?	**Yes**	
	Is it clear whether the document is a guideline, policy, protocol or standard?	**Yes**	
2.	**Scope/Purpose**		
	Is the target population clear and unambiguous?	**Yes**	
	Is the purpose of the document clear?	**Yes**	
	Are the intended outcomes described?	**Yes**	
	Are the statements clear and unambiguous?	**Yes**	
3.	**Development Process**		
	Is there evidence of engagement with stakeholders and users?	**No**	
	Who was engaged in a review of the document (list committees/ individuals)?	**N/A**	
	Has the policy template been followed (i.e. is the format correct)?	**Yes**	
4.	**Evidence Base**		
	Is the type of evidence to support the document identified explicitly?	**Yes**	

		Yes/No/ Unsure/NA	Comments
	Are local/organisational supporting documents referenced?	**Yes**	
5.	**Approval**		
	Does the document identify which committee/group will approve/ratify it?	**N/A**	
	If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document?		
6.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	**No**	
	Does the plan include the necessary training/support to ensure compliance?	**N/A**	
7.	**Process for Monitoring Compliance**		
	Are there measurable standards or KPIs to support monitoring compliance of the document?	**No**	
8.	**Review Date**		
	Is the review date identified and is this acceptable?	**No**	
9.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation?	**No**	
10.	**Equality Impact Assessment (EIA)**		
	Has a suitable EIA been completed?	N/A	

Committee Approval (Paediatric Guidelines Group)			
If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner			
Name of Chair	**Dr Claire Mitchell**	**Date**	**16/04/2024**
Ratification by Management Executive (if appropriate)			
If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner			
Date: n/a			