

# Factfile:

## Cardiac murmurs in children

### Summary

- Innocent murmurs occur in up to 80% of children at some time or other.
- Central cyanosis or heart failure should prompt urgent specialist referral even if there are no murmurs.
- Diastolic murmurs should always be regarded as pathological.
- Expert echocardiography will almost always enable a complete diagnosis to be achieved.

### Introduction

Although a heart murmur is an important presenting feature of a cardiac disorder in infancy and childhood, innocent murmurs are very common, occurring in up to 80% of children at some time or other. These murmurs are frequently detected during a febrile illness and are also exacerbated by nervousness or exercise. It is important to distinguish between innocent and pathological murmurs and to arrange more detailed evaluation of the child if there is any doubt. Children should be routinely screened for heart murmurs and other evidence of cardiac disorder at about six weeks and nine months of age and at any subsequent examinations during childhood. Serious cardiac pathology may exist without symptoms.

### Innocent murmurs

The commonest innocent murmur in children of any age (most often heard at age three to six years) is the parasternal vibratory ejection systolic murmur which has a very characteristic low-frequency 'twanging' or musical quality. It is localised to the left mid-sternal border or midway between the apex and left lower sternal border, is of short duration, low intensity and is loudest when the child is supine often varying markedly with posture. Asymptomatic murmurs found incidentally during febrile illness, if innocent, may well disappear when the child has recovered.

The venous hum is a continuous murmur heard around the thoracic inlet and can usually be abolished by head movements or by lying the child supine.

The innocent right ventricular outflow tract murmur (pulmonary flow murmur) is a soft ejection murmur heard at the left upper sternal border. Innocent carotid bruits are common in normal children and can usually be abolished by head movements.

### What is not innocent?

In addition to listening for murmurs careful attention should be paid to the presence of other evidence of cardiac pathology. The features listed below indicate that a murmur is likely to be pathological and that prompt expert evaluation is needed. Central cyanosis or heart failure should prompt urgent specialist referral even if there are no murmurs.

- Cyanosis or clubbing
- Abnormal breathing (tachypnoea, intercostal recession)
- Failure to thrive
- Abnormal pulses - diminished or absent femorals
- Abnormal cardiac impulse
- Hepatomegaly
- Thrill over precordium or suprasternal notch
- Presence of an ejection click
- Radiation of murmur to the back
- A murmur which is purely diastolic
- Abnormal heart sounds

### Factfiles

You can access and download previous editions of our Factfiles from our website and you can also register to receive our Factfiles electronically. Visit [bhf.org.uk/factfiles](http://bhf.org.uk/factfiles)

### Our research

You will find information about our research milestones and congenital heart disease at [bhf.org.uk/science/research-milestones](http://bhf.org.uk/science/research-milestones)



# Factfile:

## Pathological systolic murmurs

Systolic murmurs maximal at the upper sternal borders are more likely to be ejection in type due to heart outflow abnormality or increased flow. Left ventricular outflow stenosis is often maximal on the right radiating to the neck, right ventricular outflow stenosis and atrial septal defect murmurs are louder on the left (the former may radiate to the back). Those at the lower sternal border are more likely to be due to ventricular septal defect or mitral or tricuspid regurgitation. Some pathological systolic murmurs are heard widely over the whole praecordium and different types of murmur may coexist. Coarctation of the aorta may cause a murmur over the back particularly in the interscapular region (when the femoral pulses will almost always be diminished).

## Pathological diastolic murmurs

Diastolic murmurs should always be regarded as pathological. Early diastolic decrescendo murmurs are associated with incompetence of a semilunar valve. Mid or late diastolic murmurs are found at the lower sternal borders in patients with stenosis of or increased flow through the mitral or tricuspid valves.

## Continuous murmurs

Continuous murmurs are heard throughout systole and diastole and are a feature of persistent ductus arteriosus or vascular malformation. With the exception of the venous hum (see above) they are always pathological.

## Investigations

Chest X-ray and electrocardiography are very rarely useful in deciding if a murmur is innocent and are no longer indicated as routine investigations for children with asymptomatic murmurs. If genuine pathology is suspected echocardiography, in expert hands, will almost always enable a complete diagnosis to be achieved.

## Summary

Children should be screened for the presence of cardiac disorder by careful clinical examination soon after birth, at 6-8 weeks, again at 9 months and opportunistically during later childhood. These examinations must include palpation of the femoral pulses to exclude coarctation of the aorta that is sometimes missed at early examination. During examination attention should be paid not only to the presence of a murmur, but also to abnormalities of the praecordial impulse, the heart sounds, the respiratory rate and the child's general wellbeing. The absence of symptoms does not exclude important pathology. If in doubt, referral to a paediatric cardiologist is essential.

## BHF resources

The following resources may be helpful to you and your patients:

### For parents:

Children with congenital heart disease – DVD featuring family case studies with practical advice

Understanding your child's heart – single subject booklets about different congenital conditions

### For children and young people:

We'll tell you what we want – DVD for teenagers growing up with heart conditions

Operation fix-it – a book for 7-11 year olds about hospital admission

The small creature – a book to help children cope with bereavement from heart disease

[yheart.net/meet](http://yheart.net/meet) – our website for young people with a heart condition

### To order

Visit our website [bhf.org.uk](http://bhf.org.uk) to view or order our publications or order free of charge on 0870 600 6566.

Factfile is an information resource produced by the British Heart Foundation for GPs based on up to date clinical evidence and expert opinion. As a digest of many data sources, it is necessarily the culmination of assessments made by the BHF's medical professionals and should not be taken as a definitive statement of correct clinical practice in any given situation. Consequently, the BHF is not able to give any warranties in relation to particular clinical decisions taken or courses of treatment or action pursued based upon the information contained in the Factfiles.

**You can download previous versions of our Factfiles from our website [bhf.org.uk/factfiles](http://bhf.org.uk/factfiles)**

**British Heart Foundation**  
Greater London House  
180 Hampstead Road  
London NW1 7AW  
Telephone 020 7554 0000

© British Heart Foundation 2011, registered charity in England and Wales (225971) and in Scotland (SC039426).