



# Understanding your child's heart

## Patent ductus arteriosus



## About this factsheet

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This factsheet is for parents of babies and children who have patent ductus arteriosus (PDA), which is also known as persistent arterial duct.

It explains:

- what patent ductus arteriosus is and how it is diagnosed
- how patent ductus arteriosus is treated
- the benefits and risks of treatments.

This factsheet does not replace the advice that doctors or nurses may give you, but it should help you to understand what they tell you.

## The normal heart

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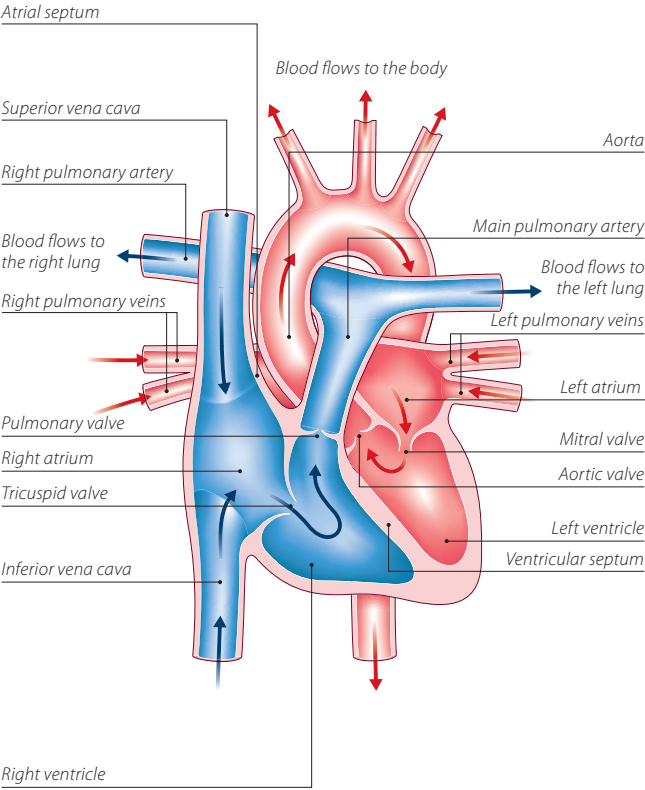
The heart is a muscular pump which pumps blood through the body and lungs. There are four chambers in the heart. The two upper ones are called the right atrium and left atrium. These are separated by a wall called the atrial septum. The two lower chambers are called the right and left ventricles, and are separated by a wall called the ventricular septum.

On each side of the heart, blood passes from the atrium, through a heart valve – the tricuspid valve on the right, and the mitral valve on the left – into the ventricle. The ventricles are the main pumping chambers of the heart. Each ventricle pumps blood out into an artery. The right ventricle pumps blood – blue in the illustration – into the pulmonary artery (the blood vessel that takes blood to the lungs). The left ventricle pumps blood – red in the illustration – into the aorta (the blood vessel that takes blood to the rest of the body).

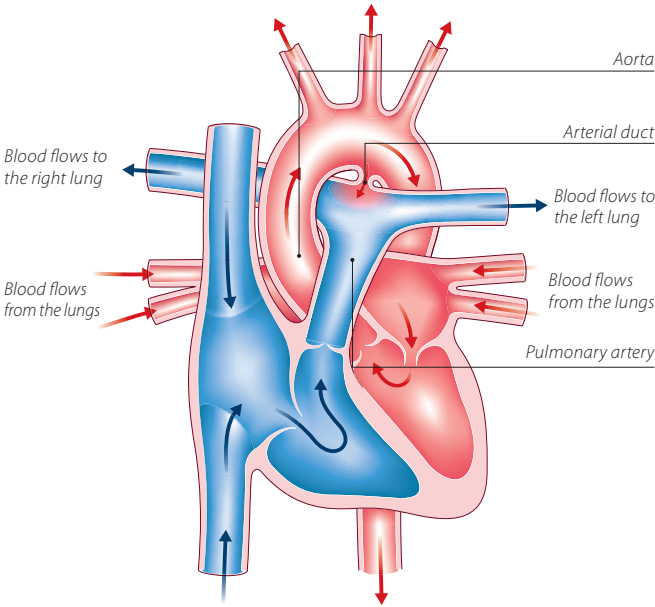
Blood flows from the right side of the heart, through the pulmonary valve into the pulmonary artery, and then to the lungs where it picks up oxygen. The oxygen-rich blood flows back into the left side of the heart through the pulmonary veins.

The left ventricle then pumps the oxygen-rich blood out of the heart through the aortic valve and into the aorta, and all around the body. The blood then returns to the right side of the heart through two main veins – one from the upper body (superior vena cava), and the other from the lower body (inferior vena cava).

**The normal heart**



**The heart with patent ductus arteriosus**



## What is patent ductus arteriosus?

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The arterial duct (ductus arteriosus) is a short blood vessel connecting the two main arteries of the heart - the aorta and the pulmonary artery.

Before a baby is born the arterial duct allows blood to go around their lungs. After the baby is born and the lungs fill with air, the arterial duct is no longer needed - it usually closes by itself within the first week after birth.

Sometimes the duct fails to close by itself and remains open (patent). This is called patent ductus arteriosus or PDA for short. It is sometimes called persistent arterial duct.

PDA causes too much blood to be delivered to the lungs. This causes congestion - a build-up of blood.

This may only cause mild symptoms in young children (such as breathlessness) but if a duct is left untreated over a period of many years it may eventually lead to permanent damage to the heart and lungs. This can be life threatening as your child reaches adulthood, so it is important that large ducts are treated when your child is young and before their heart or lungs have been permanently damaged.

If the duct is small there is a very small risk of damage to the heart or lungs. There is also a risk that a serious infection could occur inside the duct later in your child's life. So it is recommended that even small ducts should be closed.

## Premature babies

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PDA is common in premature babies and is more likely to cause symptoms.

If it is difficult to wean your baby off the life support machine, your doctor will usually recommend using medication to try and close the duct.

If this fails, or if medication is not considered appropriate, your child will need to have an operation to close the duct.

## How is PDA diagnosed?

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Because babies and young children often show no symptoms, PDA may not be found until they are older. It's not unusual for PDA to be diagnosed in older children, teenagers or even in adults.

Usually the only test that is needed to make the diagnosis is an echocardiogram, a painless ultrasound scan of the heart.

## How is PDA treated?

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PDA is treated with:

- keyhole treatment or
- open-heart surgery.

Most ducts are small (only a couple of millimeters or so wide) and can be safely closed using a 'keyhole' treatment. If your child has a larger duct they may need open-heart surgery.

## Keyhole treatment for PDA

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- Your child will be given a general anaesthetic.
- A small thin tube called a catheter will be inserted into a vein at the top of their leg.
- X-rays are used to guide the catheter to the right position in the heart.
- Once the catheter is in the right position a small stainless steel coil (like the spring of pen) is threaded along the catheter and placed inside the duct to seal it closed.
- If the duct is large, a plug, (shaped like a tiny champagne cork) made of fine wire, will be used instead of the steel coil.
- The catheter will be removed.
- Both the steel coil and the plug are designed to stay in position. once the catheter has been removed, and will stay in place for the rest of your child's life.

The PDA does not always close completely as soon as the coil or plug (also called a closure device) is inserted. Sometimes it takes a few weeks for the body's own tissue to grow around it as part of the healing process and seal it completely.

After the treatment your child will need to stay in hospital for a day. Your child can return to normal activities within a few days. He or she will need to attend the outpatient department a few weeks later for a check up.

## What are the risks associated with keyhole treatment?

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Keyhole treatment is very successful and almost all children will survive without any major complications.

There is a small risk that the closure device will not completely close the duct. If there is only a very small space left around the device it may heal up on its own without treatment. If it doesn't heal on its own, it is usually necessary to repeat the treatment one or two years later.

There is a very small risk that the closure device may move out of position. If your child has a **steel coil** this is not usually serious - it is usually possible to remove it using a keyhole technique and to put a larger coil in. If your child has a **plug**, and it moves out of position, a bigger operation may be necessary to remove it.

There is a very small risk that the device may become infected. This is a very serious complication and would almost certainly require open-heart surgery to remove the device.

## Open-heart surgery

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If your child has a larger PDA they may need open-heart surgery.

- Your child will be given a general anaesthetic.
- The surgeon will make a cut in their chest to get access to their heart.
- The surgeon will tie the duct to close it.
- Your child's chest will be stitched closed.

Your child will need to stay in hospital for a few days following the operation, and then return to the outpatient's department a few weeks later for a check up. Most children return to normal activities a few weeks after surgery.

Your child will have a scar along the side of their chest afterwards.

## What are the risks of open-heart surgery?

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Open-heart surgery to close a PDA is usually very successful and carries a very low risk of death. The majority of children will survive the surgery without any major complications.

There is a small risk that the duct may not completely close, even after surgery. If this is the case it is almost always possible to complete further treatment using the keyhole method, rather than a second open-heart surgery.

## Premature babies with PDA

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We know that premature babies with PDA have a higher risk of dying shortly after birth than babies who were not premature. This is rarely as a direct result of PDA or its treatment, and may be caused by other problems related to their prematurity.'

## What happens as my child grows up?

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Most children will remain completely well and lead a normal, active life after treatment. There is no need to restrict your child's physical activity and no special precautions are necessary.

## About the British Heart Foundation

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The British Heart Foundation is the nation's heart charity, saving lives through pioneering research, patient care and vital information.

### What you can do for us

We rely on donations to continue our vital work. If you'd like to make a donation, please ring our Supporter Care team on **0844 847 2787**, contact us through our website at **bhf.org.uk/donate** or send it to us at the address on the back cover.

### For more information

#### British Heart Foundation website

**bhf.org.uk**

For up-to-date information on heart disease, the BHF and its services.

#### Heart HelpLine

**0300 330 3311**

For information and support on anything heart-related.

#### www.yheart.net

A website for young people with heart conditions.

## Other resources

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### Understanding your child's heart series

This factsheet is one of the titles in the Understanding your child's heart series. For a full list of booklets and factsheets available in this series, see our website [bhf.org.uk/congenital](http://bhf.org.uk/congenital) or call the Heart HelpLine on 0300 330 3311 (local rate number).

### Children with congenital heart disease (DVD)

Three families share their experiences from diagnosis to treatment, and staff at the Evelina Children's Hospital offer guidance on parents' common concerns.

### Operation Fix-it

A short story book about eight-year-old Tom's experience in hospital for a heart operation. Prepares children for their hospital visit in an interesting and sometimes humorous way.

### Physical activity – What if my child has a congenital heart condition?

This short booklet contains advice and information for parents and carers to help you make it easy and enjoyable for your child to be physically active.

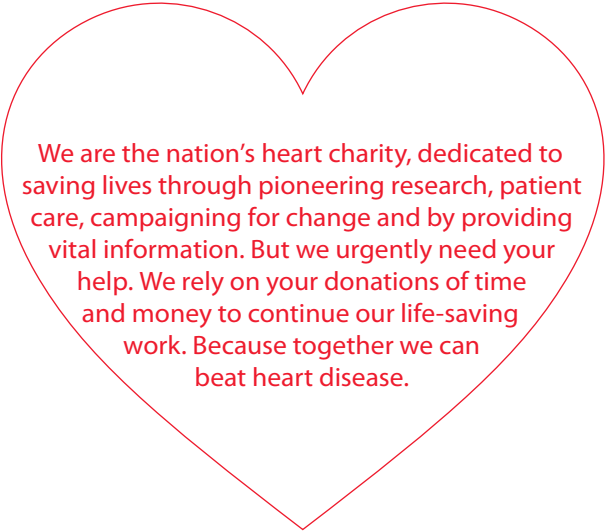
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We are the nation's heart charity, dedicated to saving lives through pioneering research, patient care, campaigning for change and by providing vital information. But we urgently need your help. We rely on your donations of time and money to continue our life-saving work. Because together we can beat heart disease.

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Information & support on anything  
heart-related. Phone lines open  
9am to 5pm Monday to Friday.  
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