



The Leeds  
Teaching Hospitals  
NHS Trust

# Patent Ductus Arteriosus (PDA) in newborn infants

Information for parents and carers



Leeds children's  
hospital

caring about children



Yorkshire and Humber  
Congenital Heart Disease  
Operational Delivery Network

## Introduction

Your baby has been found to have a Patent Ductus Arteriosus (PDA). This is not unusual in newly born babies, especially those born prematurely. This leaflet is for families or carers of babies who have been found to have a PDA and is intended to give you more information about this condition. We will explain what a PDA is, how it is detected, how it is treated and how it will be followed up.

## What is a Patent Ductus Arteriosus (PDA)?

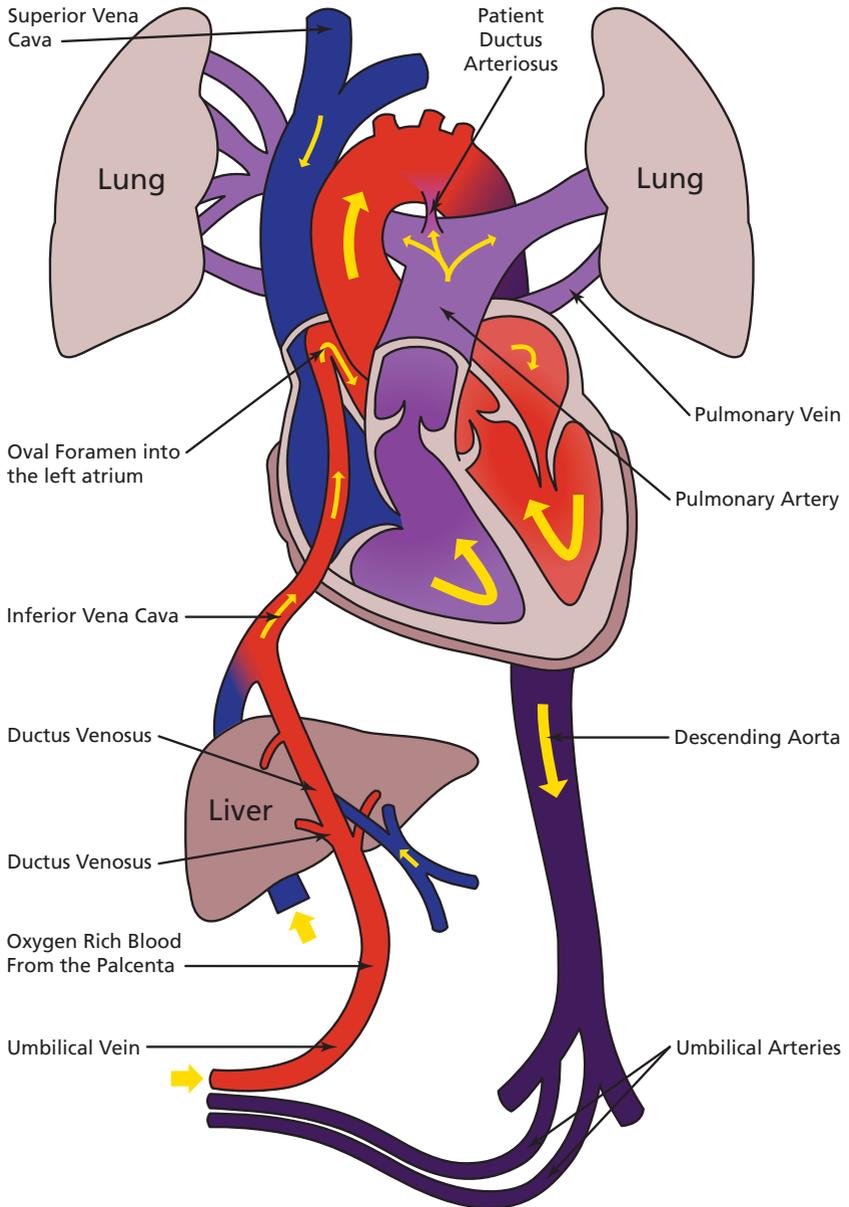
The heart contains four chambers, two filling chambers which receive blood from the lungs and the body and two pumping chambers which supply the lungs (via the pulmonary artery) and the body (via the aorta).

Whilst babies are in the womb, their lungs are filled with fluid and as a result very little blood goes to the lungs. The placenta provides the oxygen for the baby. The ductus arteriosus, often called "the duct", is a blood vessel between the pulmonary artery and the aorta which allows blood to by-pass the lungs during fetal life. All babies need this connection in order to survive in the womb.

After birth, when the baby cries and starts to breathe, the fluid in the lungs is replaced by air so the blood can pick up oxygen. As a result the ductus arteriosus is no longer required and in full term babies usually closes within the first few hours after birth. Blood then circulates to the lungs via the pulmonary artery to be oxygenated.

In some babies, especially babies who are born prematurely, the duct remains open or 'patent'. This is referred to as a patent ductus arteriosus or PDA.

# Circulation before birth



## Circulation after birth

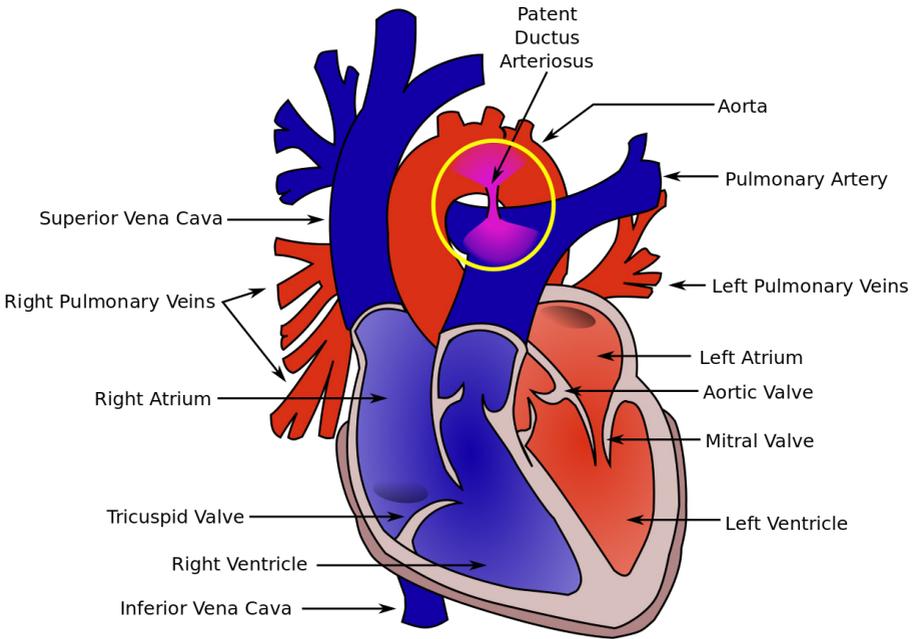


Image by Original uploader was BrownCow. - [http://en.wikipedia.org/wiki/File:Patent\\_ductus\\_arteriosus.jpg](http://en.wikipedia.org/wiki/File:Patent_ductus_arteriosus.jpg), Public Domain, <https://commons.wikimedia.org/w/index.php?curid=18938493>

## What causes a PDA?

It is not known why some children develop a PDA and others do not. Genetic factors and infection during life in the womb can predispose babies to developing PDAs and girls tend to develop PDAs slightly more commonly than boys. However, by far the commonest cause of a PDA is being born prematurely. This is because preterm babies' blood vessels still have some developing to do and the duct tissue is not as able to constrict after birth. In addition, premature babies are often poorly and so the levels of oxygen in their blood fluctuate. This can cause the duct to open up again, even after it has closed.

## How is a PDA diagnosed?

The doctor or midwife who examines your baby in the days following birth will listen to your baby's heart using a stethoscope and if they hear a murmur (a whooshing noise) a PDA is one of the possible causes. Most PDAs are diagnosed in babies who are being looked after on the neonatal unit.

In addition to a heart murmur the baby may show faster breathing, fluctuating blood oxygen levels, or a very active pulse that is easy to feel. The heart may appear larger on a chest x-ray. If there is a suspicion of a PDA an echocardiogram or "echo" will be performed. This is an ultrasound scan of the heart which shows the structure and function of the heart. This allows the doctor to see the size of the PDA, the direction of the blood flowing across it and whether it is likely to close on its own or need treatment to help close it.

## What are the effects of a PDA for my child?

Having this extra connection means that each time the heart beats, more blood flows to the lungs than normal. This results in shortness of breath or a need for extra oxygen or more support from the breathing machine. The other effect is that blood is "stolen" by the lungs rather than supplying the rest of the body, resulting in the heart having to work harder.

It can also result in feeding difficulties as they need to co-ordinate breathing and feeding which can be more difficult. Although uncommon, having a very large PDA does mean there is a higher risk of lung problems (chronic lung disease) and intraventricular haemorrhages (bleeding into the fluid spaces in the brain). There is also a higher risk of gut inflammation called necrotising enterocolitis (NEC) because the blood flow to the bowel may not be normal.

These conditions may result in a longer stay in hospital and possibly more investigations and treatment which will be discussed in more detail if your child develops these complications. The staff will be observing your child closely for any of these potential complications.

## Does my baby need any treatment?

The majority of PDAs close on their own over time, without the need for any treatment. Whilst we are waiting for the duct to close we may choose to give a water medicine (diuretic) which reduces the amount of fluid on the lungs. These medicines should help your baby's breathing whilst we wait until the duct closes on its own. We may also reduce the volume of fluid your baby is given in the short term to prevent the lungs becoming too wet. If it looks like the duct isn't going to close on its own then there are three options; medicines, surgery or intervention via a cardiac catheter from the groin.

Medical treatment involves giving an anti-inflammatory drug called Ibuprofen or Paracetamol (the same as you might take for pain relief). These medicines work by narrowing the duct until it eventually closes by itself. Ibuprofen does have some known side effects including temporarily affecting the kidneys, a small risk of bleeding and sometimes irritation of the gut lining, all of which are rare and will be checked for whilst your child is on the medication. There is now evidence that Paracetamol can also help close the duct and in some situations this may be used instead. If the drug treatment does not work or it is not suitable for your baby then, a small operation may be performed to close the PDA. This can be done either by using a closure device passed up from a vein in the groin or in babies who are still too small for this (usually babies less than 1.5Kg), by making a small opening in the chest and putting a clip on the PDA.

Fortunately most babies do not require an operation however if it is required in your baby the doctors from the Congenital Heart Team and the Neonatal Team will discuss this with you. These procedures would be carried out in the Leeds Children's Hospital Congenital Heart Centre.

## **What if I am discharged and my child still has a PDA?**

Sometimes babies are discharged home with a PDA in the expectation that it will close on its own. You will be given a follow up appointment in the heart clinic to monitor the progress of the PDA. It is important to continue with any medicines as instructed. Please let the clinic team know if you need to change the appointment.

## **When to seek medical help?**

You should seek urgent medical attention if your baby starts to show signs of increased shortness of breath, changing colour to pale or blue or having prolonged pauses in breathing. Sometimes with a very big PDA your baby may struggle to put on weight.

These may be signs to suggest your baby is developing heart failure and may need extra treatment to prevent this. If you are at home with your baby and you are worried, please contact your GP or Health Visitor for support and advice.

## **What does a PDA mean for your child's future health?**

Once the PDA is closed, there should be no long term effects. There are no specific precautions you need to take and it will not have any impact on their life. If a duct has been closed by a device or by a clip this stays inside the body forever. It is very safe and it is extremely unlikely that it will need to be removed.

It is not affected by your child's growth and will be monitored by the heart doctors for just a short time.

## Does my child need to be seen again?

Your GP, children's doctor (Paediatrician, Neonatologist or Cardiologist) or Specialist Nurse may suggest follow up for your baby. In particular, this includes monitoring their growth, feeding and general health. Of course, if you are concerned yourself then please seek medical advice.

## Further information:

There is more information on PDAs online. Some parents find the following website helpful:

### Leeds Congenital Hearts

<http://leedscongenitalhearts.com>



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