



Patent Ductus Arteriosus (PDA)

Information for parents

Information Leaflet for Patent Ductus Arteriosus

This leaflet has been given to you because your baby may have been born with Patent Ductus Arteriosus (PDA), commonly referred to as a “duct”. This is quite a common condition in babies born prematurely.

The more the premature baby is, the higher the risk of PDA. Sometimes the PDA needs treating and sometimes it closes on its own. In our experience, sometimes this can cause a lot of anxiety and confusion among some parents.

This leaflet is designed to help answer some questions you may have if your baby has been diagnosed with a PDA. The doctor and the neonatal team looking after your baby would be happy to answer any further questions and discuss in more detail.

What is a Patent Ductus Arteriosus?

A normal heart has four chambers – two filling chambers (atrium) and two pumping chambers (ventricle). The right ventricle pumps the blood to the lungs via a big vessel called the pulmonary artery and the left ventricle pumps the blood to the rest of the body via a big vessel called the aorta.

Whilst the baby is in the womb, the baby's lungs are filled with fluid and they receive very little blood. The mother's placenta provides oxygen for the baby. The ductus arteriosus is a natural connection between the aorta and pulmonary artery while the baby is in the womb. This connection helps blood to by-pass the lungs while they are not being used for breathing in the womb. This is called foetal circulation (fig 1). All babies need the ductus arteriosus to maintain the foetal blood circulation in the womb.

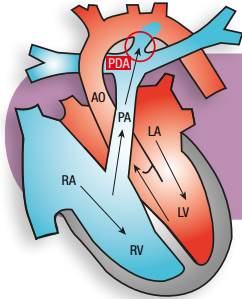


Fig 1: Foetal circulation

Diagram showing foetal circulation

After birth, the fluid from lungs disappears and the baby starts to breathe, the lungs start receiving blood to take the oxygen around the body. The ductus arteriosus is no longer needed and usually it closes shortly after birth. This establishes the neonatal circulation (fig 2).

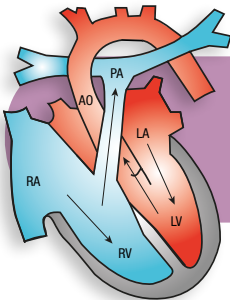


Fig 2: Neonatal circulation

Diagram showing neonatal circulation

In some babies, especially in those born prematurely, this vessel may remain open (patent). This is called a patent ductus arteriosus (PDA) or commonly referred to as a 'duct' (Fig 3).

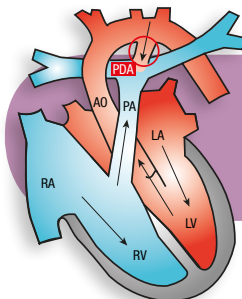



Fig 3: Patent Ductus Arteriosus (PDA)

Diagram showing neonatal circulation with a PDA

RA (right atrium), RV (right ventricle), LA (left atrium), LV (left ventricle), AO (aorta), PA (pulmonary artery), PDA (patent ductus arteriosus), arrow showing direction of blood flow



What are the consequences if PDA stays open?

As there is increased blood flow to the lungs, your baby may experience breathing difficulties. Every baby responds differently to this increased blood flow to the lungs.

Why does my baby have a PDA?

After birth your baby must use their lungs to take in oxygen and remove carbon dioxide. To achieve this, the blood now needs to go through the lungs instead of bypassing through the ductus arteriosus. Hence, the ductus arteriosus is no longer needed and closes.

The ductus arteriosus normally closes within the first few hours or days after birth. However in some babies, especially premature babies, it may remain open or even re-open. **The more premature the baby, the higher the risk of a PDA. You did not do anything wrong during the pregnancy to cause the PDA – it is just a common heart defect, especially among babies born prematurely.**

What are the effects of a PDA on the blood circulation in the baby?

After birth the blood flow across the PDA changes and the blood starts flowing (shunting) from the aorta to the pulmonary artery. In babies with a PDA this may give rise to two situations:

1. There will be excessive blood flow in the lungs
(normal blood flow from pulmonary artery and 'extra' blood via PDA)
2. Blood is 'stolen' from the aorta which leads to decreased blood flow in other organs of the body

Sometimes these breathing difficulties are mild but some babies may need increased breathing support with a ventilator or other specialist equipment. Occasionally it may be difficult for a baby to breathe without the support of the ventilator.

The heart has to work harder to pump blood around the body, which can lead to heart failure (which is completely reversible). A PDA has also been related to a delay in establishing feeds (feed intolerance) and increased fluctuation in oxygen levels in the blood. Although a PDA is not the sole cause it has also been linked to longer term lung problems (chronic lung disease) and bleeding in the brain.

How is a PDA diagnosed?

The doctor will examine your baby by listening to the heart, talking to the nurses, reviewing the observations, checking blood results and taking a chest x-ray of your baby. A heart murmur may be heard by the doctor examining your baby. In some babies a PDA is suspected when they have difficulty in coming off the ventilator or other breathing machine.

The diagnosis is confirmed with an ultrasound examination called echocardiogram (commonly referred as 'echo'). This examination is similar to the ultrasound you had when you were pregnant.

Your doctor will assess the significance of the PDA during the echocardiogram assessment. Every baby is different and every baby's heart adapts to the effects of a PDA differently. If your baby appears to be healthy, your doctor is likely to choose to monitor the situation until the PDA closes itself. However, if the PDA is thought to be large and causing problems to your baby then your doctor might consider treating the PDA.



How is a PDA treated?

Depending upon the clinical situation and severity of the PDA your doctor may choose one of three options (which may change with time):

1. No treatment (conservative approach): If the PDA is small or your baby is making good clinical progress, the doctors may wait to see if it closes on its own. A PDA is very common in preterm babies. A large proportion of preterm babies don't need any treatment, and the PDA will close spontaneously. Your baby will be monitored carefully in order to avoid possible harmful consequences.

2. Medical treatment: Your doctors may choose to start giving a medicine developed specifically for premature babies to close the PDA. Your baby will be monitored closely while the drug is being given, as this can temporarily affect how the kidneys and gut work.

The doctors may decide to decrease the amount of fluid being given to your baby to help the PDA to close or stop feeds whilst this drug is being given. Medical treatment may close the PDA or make it smaller. Sometimes your doctors may choose to start water medicine (diuretics) to reduce the extra fluid that sometimes can accumulate with the PDA.

3. Surgical closure: If medical treatment does not work or the baby is not suitable for drug treatment due to other medical problems, the PDA will need to be closed with an operation. Fortunately, not many babies need this operation. The reasons for this operation will be fully discussed with you.

The doctors would be happy to discuss any of these options in more detail.



Who should I ask if I have further questions?

The nurse and neonatal team looking after your baby will be happy to answer any further questions you may have. If you need an interpreter the nurses can arrange for one to be present. If you would like to seek support from the counsellor or psychologist you can discuss this option with the nurses or doctors in the unit.



This leaflet was developed by Dr Yogen Singh, Consultant Neonatologist and Paediatrician with expertise in Cardiology at Cambridge University Hospitals and supported by Recordati Rare Diseases