



Patent Ductus Arteriosus (PDA)

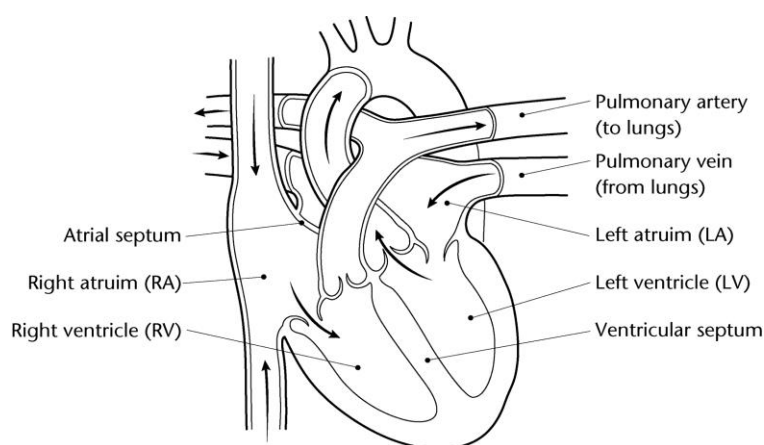
The ductus arteriosus is a blood vessel that is formed during fetal growth. While in the womb, fetal circulation lets blood flow straight from the aorta to the pulmonary, going around the lungs. Within minutes or up to a few days after birth, the ductus arteriosus closes (Picture 1). This change is normal in newborns.

In some babies, however, the ductus arteriosus stays open (patent) (Picture 2). This is why it is called a patent ductus arteriosus (PDA). When this happens, it can make the heart work harder.

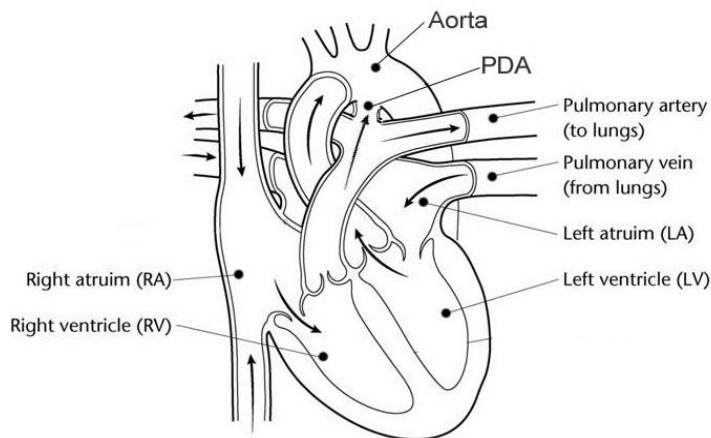
When PDA happens

PDA can happen to any baby. It may be more common in babies:

- born early (premature)
- born as females
- with neonatal respiratory distress syndrome
- with other genetic disorders, such as Down syndrome
- whose mother had rubella during pregnancy



Picture 1 A normal heart after the ductus arteriosus blood vessel has closed.



Picture 2 A heart with the patent ductus arteriosus open.

Signs and symptoms

- not feeding well
- poor weight gain
- getting tired easily
- sweating during a feeding
- a heart murmur – an extra or unusual sound heard during the heartbeat
- fast breathing, working hard to breathe, or shortness of breath
- low oxygen levels in premature babies; they may need oxygen or ventilator support

Diagnosis

For full-term babies, the health care provider looks for a PDA after hearing a heart murmur at a check-up. They usually ask a pediatric heart doctor (cardiologist) to give the child an exam. Premature babies may not have the same signs as full-term babies. Health care providers may also look for a PDA in babies who have trouble breathing soon after birth.

These two tests are usually used to diagnose a PDA:

- Echocardiogram (echo) - This test uses sound waves to take a video of your baby's heart and major blood vessels (Picture 3). This video can show how blood flows through the vessels. It can also show any problems with the way the heart is formed, how large the PDA is and how well the heart is working.
- Electrocardiogram (EKG) - This test records the electrical activity in the heart. It can show how large the heart chambers are, and other changes that may be signs of a PDA.



Picture 3 A child getting an echocardiogram done

Treatment

A PDA may shrink and go away on its own and treatment may not be needed. If a PDA is small, the health care provider may not treat it right away. Other times, treatment may be needed to close the opening. This may be different depending on your child's problems and age. For example, if your baby is born with certain types of heart problems that need the PDA to stay open, medicines may be used to keep the PDA open until surgery can be done to correct the heart defect. Your child's health care provider will talk with you about treatment choices. The most common three options for treatment are:

- medicines
- surgery
- a catheter-based procedure

Medicines

- Indomethacin (in doh METH ah sin) is a medicine that helps closes a PDA in premature infants by making it tighten up (constrict).
- Ibuprofen (eye byoo proe fen) is a medicine like indomethacin. It is often used to close a PDA in premature infants.
- Antibiotics will be given in some cases to prevent infection of the heart until the PDA is closed. This type of infection is called endocarditis.

Catheter-based procedure

This procedure is called cardiac catheterization. It is the most common way to close the PDA and can be done for older babies and patients.

- Your baby will be given medicines to help them sleep. They will not feel pain.
- The doctor will put a long, thin tube (catheter) in a large blood vessel in the upper thigh (groin). The doctor will use a catheter is equipped with a camera to move from the groin to the ductus arteriosus. Your baby's chest will not be opened during this procedure.
- A small, metal coil or other blocking device, is passed up through the catheter and placed in the ductus arteriosus. This device will block blood flow through the vessel.
- Problems with this procedure do not happen often. If they do, they do not last long. Problems may include bleeding, infection and movement of the device.

Surgery

Surgery for PDA may be done if the catheter procedure does not work or is not possible. It may also be done if the baby already has surgery planned for other heart problems.

- Surgery may not be done until after 6 months of age in babies who do not have health problems from the PDA.
- Your child will be given medicines to go to sleep. They will feel no pain during the surgery.
- The surgeon will make a small cut between your child's ribs to reach the PDA. The PDA is closed with stitches or clips.
- Problems with this procedure do not happen often. If they do, they do not last long and may include hoarseness, infection, bleeding or fluid around the lungs. The baby may need a machine to help them breathe for a short period of time.

After Surgery

- Your child will be in the hospital for a few days. Most children go home two days after surgery.
- Medicines will be given for pain or anxiety. If you think your child is having pain or discomfort at home, talk to the doctor or other health care provider.
- You will be taught how to care for your child at home. You will also learn how to give your child medicine if needed.
- Normal, everyday activity is allowed. However, your child may not play contact sports until the doctor says it is okay.
- Follow-up appointments with your child's health care providers are scheduled.
- Long-term problems from this surgery do not happen often. The doctor will talk to you about these possible problems.

Living with PDA

- All children with an open PDA have a higher risk of infection in the heart, called bacterial endocarditis. Your child will need antibiotics before any dental work and certain procedures to prevent this infection. It is important to take good care of your child's teeth to prevent tooth decay and infection.
- After the PDA is closed, your child will not need antibiotics before dental work or surgical procedures. If the PDA is closed with surgery or by catheter, and stays completely closed, antibiotics will only be needed for 6 months after the surgery.
- If you have questions, call your health care provider.

When to call 911

You should call 911 if your baby:

- is short of breath
- is working hard to breathe
- coughs up blood
- has skin turn blue around their mouth or finger tips

When to call the health care provider

You should call your health care provider if:

- your baby has a fever
- your baby has chills, a cough, or sounds congested
- skin around surgery cut (incision) is red, swollen, or has pus draining from it