

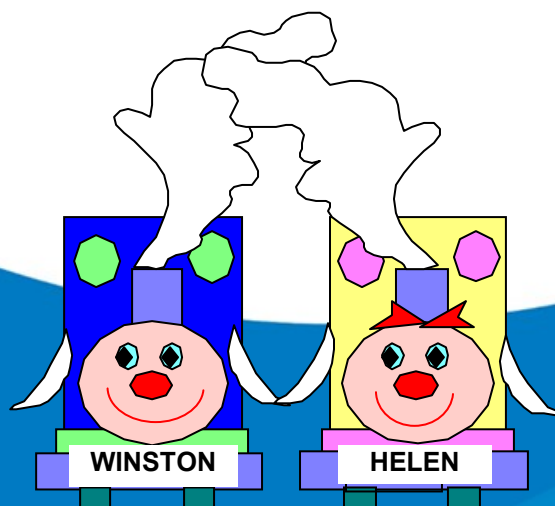
# Patent Ductus Arteriosus

## PDA

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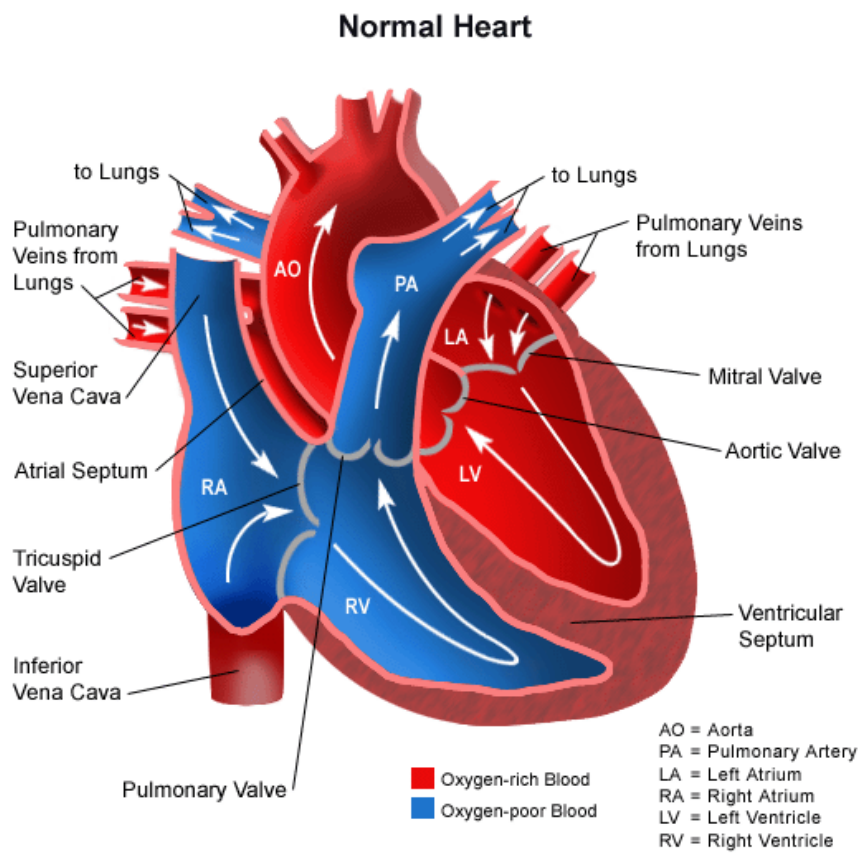
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## The normal heart

The Heart is made up of four chambers: the upper two chambers are called the atrium and the lower two are known as ventricles. Muscular walls, called septum, divide the heart into two sides. On the right side of the heart, the right atrium and ventricle work to pump deoxygenated blood to the lungs; on the left side, the left atrium and ventricle combine to pump oxygenated blood to the body.



## Notes:

## Signs & symptoms:

The symptoms of PDA depend on the size of the ductus and how much blood flow it carries. After birth, the pressures and resistance are much tighter in the aorta than the pulmonary artery, so if a ductus arteriosus is present, blood will flow from the aorta into the pulmonary artery. This extra blood flow into the lungs can overload the lungs and put an additional burden on the heart to pump this extra blood. This situation may not be well tolerated in a premature baby who already has problems related to immaturity of the lungs themselves. These babies may need more support from the ventilator and have symptoms of congestive heart failure. A newborn with a PDA may appear to have:

- Fast breathing
- Breathlessness
- Increase in work of breathing
- More respiratory infections
- Infants gets tired easily
- Poor weight gain e.g. (failure to thrive)

If the PDA is very small there may be no symptoms at all and the only way to detect the PDA is to listen to the heart for a heart murmur.

## How is the diagnosis of PDA made

- Diagnosis can be made by examination; listening to the heart sounds (heart murmur will be heard)
- X-rays may show an enlarged heart and evidence of an excessive amount of blood flow to the lungs

Echocardiogram; a special scan which can assess the structure of the heart, how the heart is handling the pumping of blood through the chambers, and the blood flow through the heart valves.

## The usual form of treatment

Often in a newborn the PDA may close on its own without any intervention. If the PDA continues after the newborn period it will generally never close on its own. Medical or surgical closure is recommended in such cases to prevent future risk of endocarditis (inflammation of the lining of the heart).

Medication may be given to aid closure of the ductus such as Indomethacin. Medications are only successful in newborn infants. If this does not work closure is often achieved by surgery where the PDA is tied off (ligated).

In older children if the ductus is small, a coil may be placed within the vessel which will expand to block the blood flow. If the ductus is larger, a flexible device can be placed within the ductus as a “plug”.

## Risks, discomforts of treatment and alternatives

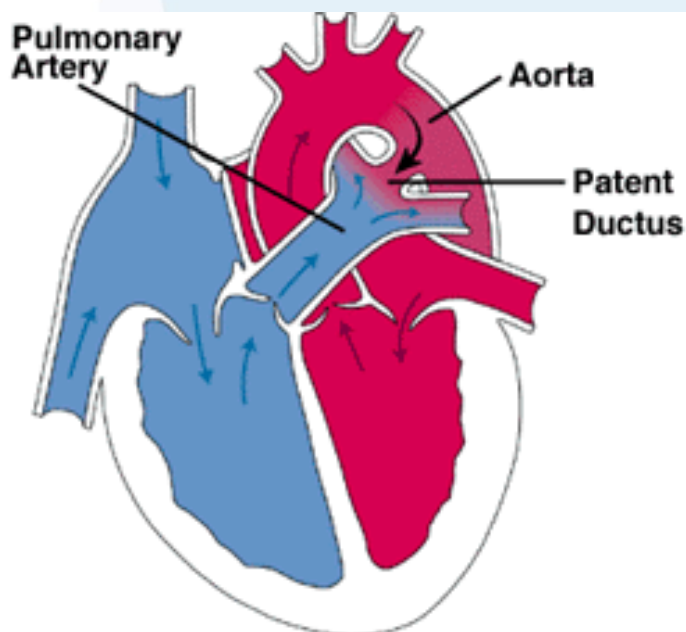
The risk of complications with any of these treatments is low, determined mostly by how ill the child is prior to treatment. All benefits and risks of treatment will be discussed with you by your specialist. Specific problems regarding treatment or surgery can not be discussed here as every child's problem needs to be assessed and treated individually.

## Nature and reasons for the condition

When a baby is still in the mother's womb a baby's lungs are not needed to supply oxygen because the baby receives oxygen via the mother's lungs and the placenta. Since baby's lungs do not provide any oxygen, there is no need for energy to be expended pumping blood to the lungs. The ductus arteriosus is a blood vessel that is present in all babies while still in the womb that allows blood to bypass the pathway to the lungs; it allows blood to flow from the pulmonary artery to the aorta.

When the baby is born and the umbilical cord is cut, the lungs are now needed to supply oxygen. Therefore the lungs expand, their blood vessels relax to accept more flow and the ductus arteriosus usually closes within the first few hours of life.

On occasion, however the ductus arteriosus does not close on its own and this is referred to as a patent ("patent" meaning open) ductus arteriosus or (PDA). While this condition is seen more frequently in premature babies, it may also appear in full term infants.



## Medicines used to treat heart problems

Many infants will not require any medications at all. For those who do here are just a few on the more common medicines:

### Frusemide & Hydrochlorothiazide

These are diuretics (water medicine) which make the kidneys pass more urine. Infants and children on these drugs lose sodium, chloride and potassium (different salts in the blood stream) and water. When the heart is not working very well, water and salt accumulate in the body, liver and the lungs, making particularly the lungs rather heavy. When these drugs are given, the lungs become somewhat lighter, easier to expand and, less energy is used in breathing thus helping the infant to breathe.

### Spironolactone/Amiloride

These are weaker diuretics (water medicine) which make the kidneys pass more urine. They hold on to potassium (salt) and are often used with other diuretics.

### Captopril & Hydralazine

These drugs dilate (open) the blood vessels and as a result reduce blood pressure. They can be used to restore normal blood pressure. They can also be used in those infants and children with normal blood pressure and a weak heart. By reducing the blood pressure this reduces the work of the heart.

### Propranolol

This reduces the rate and force of contraction of the heart muscle. It is useful in treating fast heart rates, high blood pressure and also relieving spasm of heart muscle with other more complicated heart problems.

## Medications for your infant:

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If you have any further questions, please contact your child's consultant via their secretary via the hospital switchboard 0151 426 1600. The secretaries are available Monday to Friday 9.00am to 5.00pm

If you need to contact the department outside of these hours, please phone either:

Ward 3F      0151 430 1616

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