Pressures within the heart

Why are the pressures within the heart so important?

To understand the flow of blood in and out of the heart, it is important to know that normally the pressure within each chamber of the heart is different. Normally the pressure on the right side of the heart, and in the pulmonary arteries, is lower than the pressure on the left side of the heart and in the aorta.

This is because:

- the right side of the heart pumps blue (deoxygenated) blood returning from the body back to the lungs. It normally pumps this blue blood at low pressure.
- the left side of the heart receives red (oxygenated) blood returning from the lungs. It then pumps this blood to the body at high pressure.

Children with heart defects may have:

- **A hole between the two pumping chambers of the heart** – this would mean that high pressure pumping on the left pumps some blood through the hole to the lower pressure in the right. This extra blood will be pumped to the lungs. A small amount of blood passing from the left to the right sides of the heart does not cause an increase in pressure. However, a large amount of blood will increase the pressure in the right side of the heart. This raises the pressure in the lungs (pulmonary arteries). High pressure in the lungs (pulmonary hypertension) can damage their more delicate tissues.

- **A hole between the two arteries -** Before the baby is born the ductus arteriosus (arterial duct or channel), part of the fetal circulation, joins the aorta to the pulmonary arteries. If that passage stays open then it will mean that blood from the high pressure aorta will flow into the lower pressure pulmonary arteries and so to the lungs.

- **Complex defects** - when a child's heart does not have a normal circulation, the cardiologist or surgeon may use connections between the aorta to the pulmonary artery to get blood to the lungs or to the body.
  - A medicine (prostaglandin) might be used to keep the ductus open to allow blue and red blood to mix, allowing the baby to stay temporarily well.
  - A shunt might be inserted at operation to allow the blue and red blood to mix, making them less blue.

Before a major re-plumbing operation on the heart, such as a Fontan, or Glenn Shunt, it is important that the pressures are correct in the various chambers of the heart. Careful measurements are taken by echo and sometimes by using a catheter.

If there is an obstruction of a valve (pulmonary or aortic stenosis) the pressures in the ventricles will be assessed to make sure that they are not too high. This is usually by echo.

Eisenmenger's Syndrome is the name for a very serious condition where the pressure on the right side of the heart is higher than on the left, as a result of an untreated hole in the heart. This means more deoxygenated blood is pumped from the right side of the heart to the left and around the body.