

The Fetal Heart

A baby growing inside a pregnant person's uterus (womb) is called a fetus. The fetus doesn't use its own lungs before birth, so the way blood flows through the heart is different.

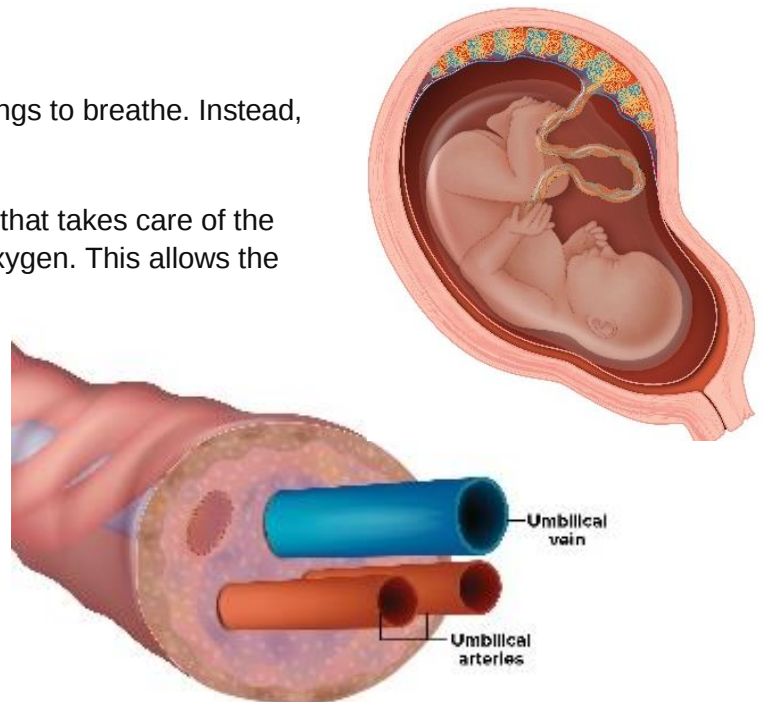
The Placenta & Umbilical Cord

When a fetus is inside the womb, it doesn't use its lungs to breathe. Instead, there's a special organ called the **placenta**.

The placenta is a temporary helper inside the uterus that takes care of the fetus' blood, removing carbon dioxide and giving it oxygen. This allows the fetus to grow without having to use its own lungs.

The placenta connects to the fetus through a tube called the **umbilical cord**. There are usually three blood vessels in the umbilical cord. Two umbilical arteries carry away the fetus's waste, and one umbilical vein brings oxygen to the fetus.

The placenta and the umbilical cord serve as the lifeline for a growing fetus within the womb.



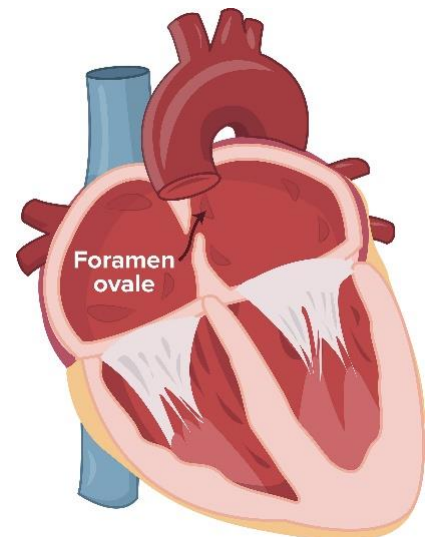
Fetal Circulation

Inside the womb, the fetus' lungs are full of fluid so there are special pathways, or shunts, that let the blood go around the lungs. One shunt is called the foramen ovale and the other is the ductus arteriosus.

The **foramen ovale** is a special passage, or hole, between the top two chambers (called atria) of the heart.

When the fetus is inside the womb, oxygen-rich blood comes from the placenta to the right side of the fetus's heart. Instead of going to the lungs, most of this blood goes through the foramen ovale to the left side of the heart. From there, the oxygen rich blood travels to the left side of the heart and out the aorta to give oxygen to the fetus' body.

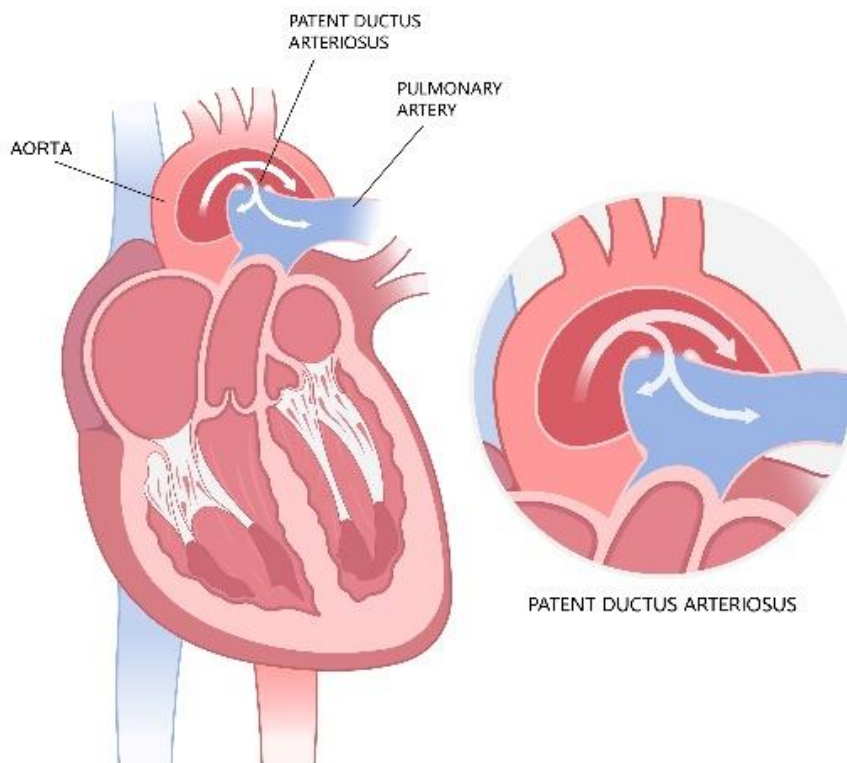
After the baby is born, the foramen ovale usually closes. Now, the blood in the right side of the heart goes to the lungs. In the lungs, the baby exchanges carbon dioxide for oxygen.



The **ductus arteriosus** is a special passage in the fetal heart that connects two important blood vessels, the pulmonary artery and the aorta.

We just learned that in a fetus, blood goes to the left side of the heart through the foramen ovale, but some of the blood stays on the right side of the heart. From there, it gets pumped toward the lungs through the pulmonary artery.

When this blood reaches the pulmonary artery, it goes through the second special pathway, the ductus arteriosus. This pathway redirects the blood into the aorta before it goes to the lungs. From the aorta, the blood travels to the rest of the fetus's body to deliver oxygen.



PATENT DUCTUS ARTERIOSUS

After birth, the ductus arteriosus typically closes. Once closed, the blood that used to go from the pulmonary artery to the aorta now goes into the lungs. In the lungs, the blood exchanges carbon dioxide for oxygen, allowing the baby to get oxygen on its own.

Also, after a baby is born, the umbilical cord is clamped, so the baby doesn't get oxygen and nutrients from the placenta anymore. As the baby starts breathing, the pressure and oxygen levels change on each side of the heart and lead to the closing of these two pathways.

Closing the foramen ovale and the ductus arteriosus shifts the baby's blood circulation from how it was inside the uterus (fetal circulation) to the normal circulation in a typical heart. If you want to learn more about the typical heart, you can [visit this link](https://video.ucdavis.edu/media/The+Typical+Heart+Function/1_of3vtu57):

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