

EB Education Revision Guide

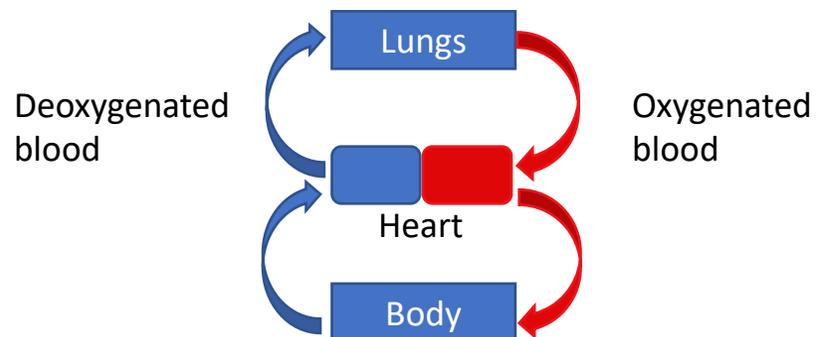


How to work with the Circulatory System: Part 1

Structure of the Heart

The Heart

The heart pumps blood through the blood vessels, so that materials in the blood (like glucose, oxygen, hormones and waste products) can be transported to and from cells.



Double Circulatory System

The mammalian heart is a double circulatory system.

- The heart pumps deoxygenated blood to the lungs to take in oxygen. The oxygenated blood returns to the heart.
- The heart pumps oxygenated blood around the body, to deliver oxygen to cells. Deoxygenated blood then returns to the heart.

Structure of the Heart

The Heart

Hearts in mammals have four chambers, and four major blood vessels.

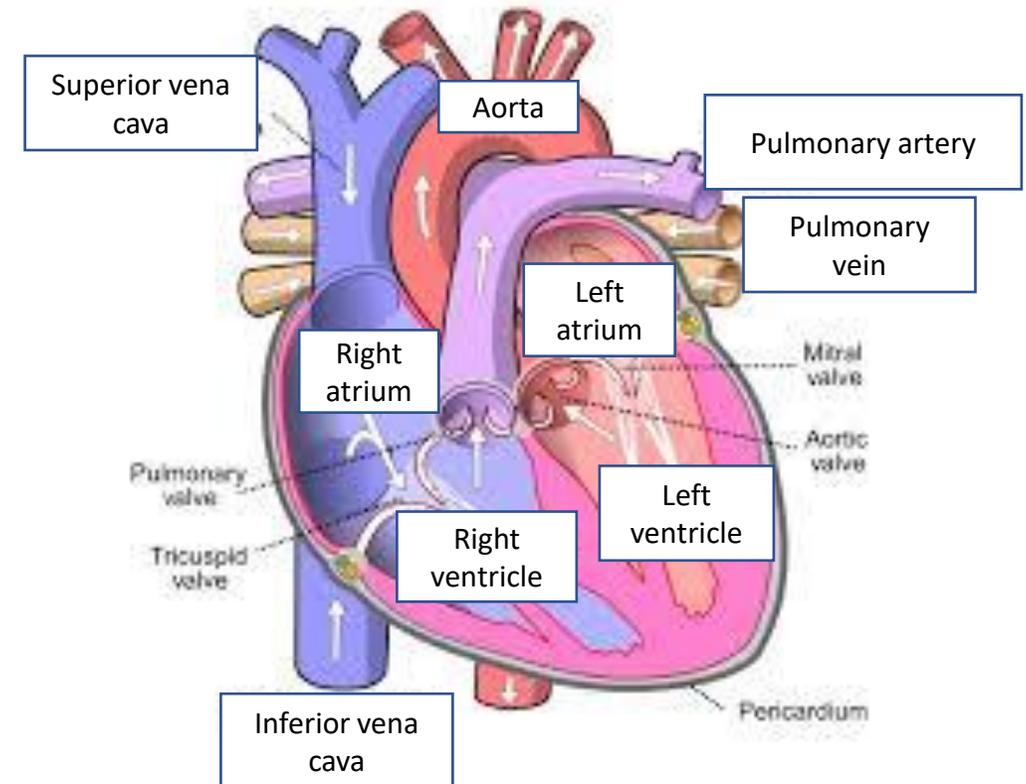
The top chambers are called atria (atrium singular), and the bottom chambers are called ventricles.

There are valves within the heart which prevent the backflow of blood.

The left ventricle has a much thicker wall than the right ventricle. This is because more muscle is needed to pump blood around the whole body at high pressure, whereas the right ventricle only pumps blood to the lungs.

Right Side

Left side





Circulation

Route through the Heart

1. Blood enters the heart in the **vena cava** (a vein). This is **deoxygenated** blood from the body. It goes into the right atrium.
2. The blood travels to the **right ventricle**.
3. The right ventricle pumps the blood to the lungs via the **pulmonary artery**.
4. **Oxygenated blood** travels back to the heart in the **pulmonary vein** and enters the left atrium.
5. It will then travel to the **left ventricle**.
6. The left ventricle will pump the oxygenated blood around the whole body via the **aorta** (an artery).

TOP TIP:

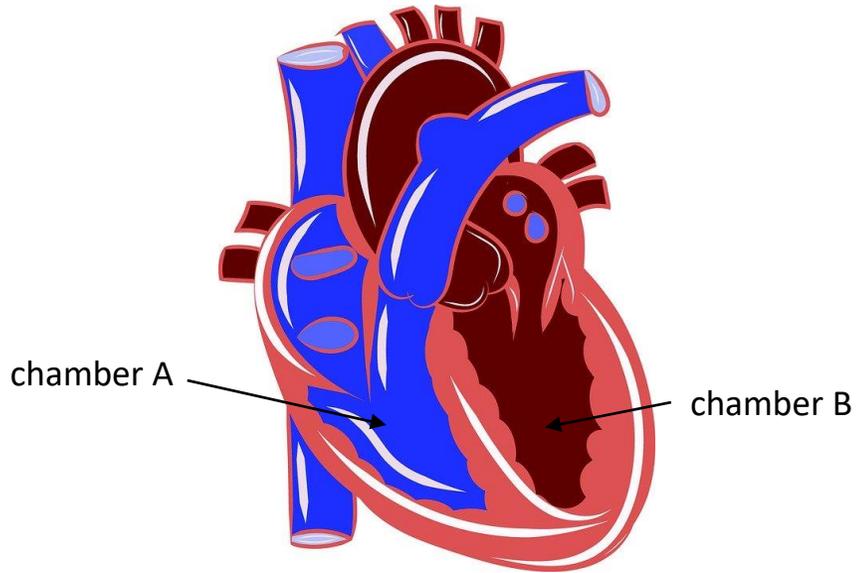
Arteries take blood away from the heart.

Veins take blood to the heart.



Your turn:

1. The diagram below shows the heart.



a) Explain why the wall of chamber B is thicker than the wall of chamber A.

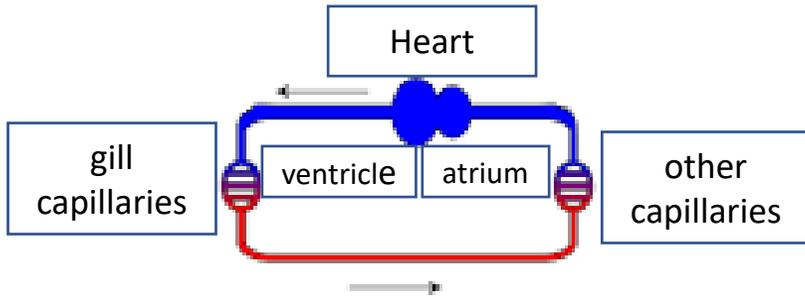
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b) Which of the following shows the direction that the blood flows in when travelling towards, through and away from the heart?

- A) pulmonary artery → atrium → ventricle → aorta
- B) vena cava → ventricle → atrium → pulmonary vein
- C) pulmonary vein → atrium → ventricle → aorta
- D) aorta → ventricle → atrium → pulmonary vein



2. The diagram below shows the circulatory system of a fish.

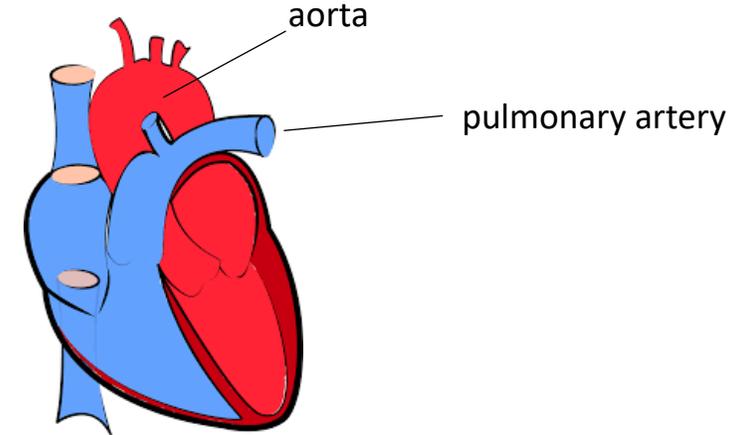


What are the differences between the human circulatory system, and the structure of the circulatory system of a fish?

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Your turn:

3. Below is a diagram of a human heart.



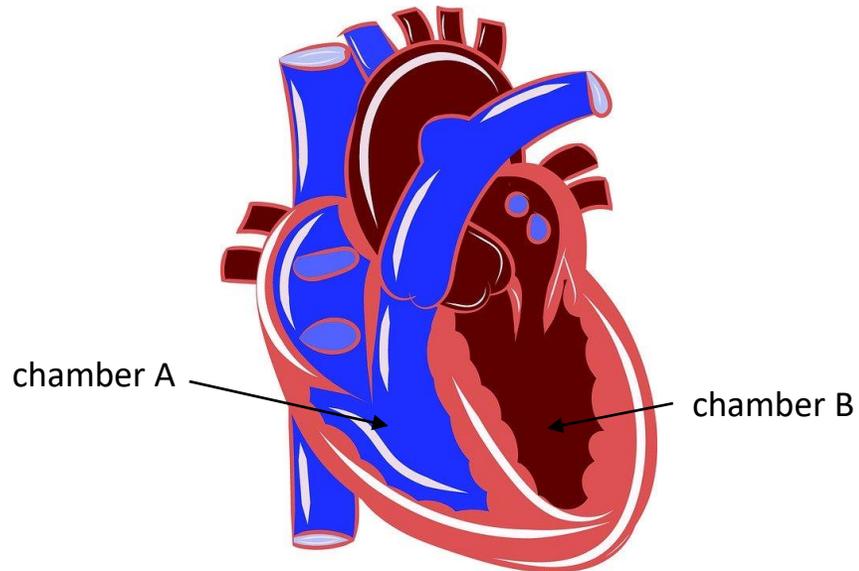
Suggest how the blood flowing through the aorta is different from the blood flowing through the pulmonary artery.

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Answers:

1. The diagram below shows the heart.



- a) Explain why the wall of chamber B is thicker than the wall of chamber A.

Wall of the left ventricle (B) is more muscular, the blood is under higher pressure as it needs to be pumped around the whole body. Chamber A pumps blood to the lungs.

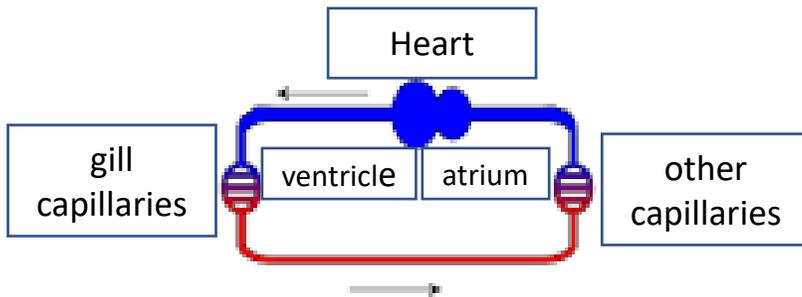
- b) Which of the following shows the direction that the blood flows in when travelling towards, through and away from the heart?

- A) pulmonary artery → atrium → ventricle → aorta
- B) vena cava → ventricle → atrium → pulmonary vein
- C) pulmonary vein → atrium → ventricle → aorta
- D) aorta → ventricle → atrium → pulmonary vein



Answers:

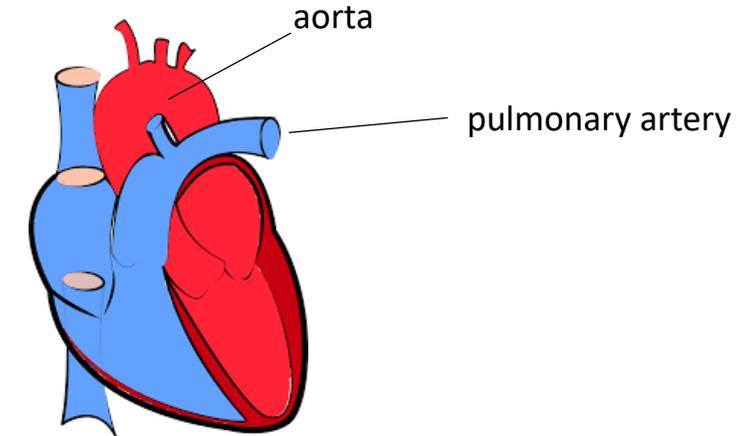
2. The diagram below shows the circulatory system of a fish.



What are the differences between the human circulatory system, and the structure of the circulatory system of a fish?

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The fish heart has 2 chambers, the human heart has 4 chambers.
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The fish heart has 1 atrium and 1 ventricle, the human heart has 2 atria and 2 ventricles.
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Only deoxygenated blood flows through a fish heart.
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The fish heart is single circulatory, the human heart is double circulatory.
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3. Below is a diagram of a human heart.



Suggest how the blood flowing through the aorta is different from the blood flowing through the pulmonary artery.

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Blood in pulmonary artery is deoxygenated, whereas in the aorta is oxygenated.
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Blood in pulmonary artery under lower pressure, whereas blood in the aorta is under higher pressure.
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