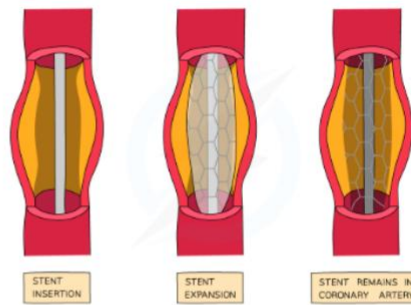


## Model Answers: Medium

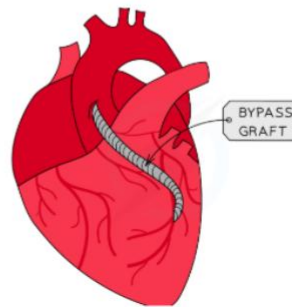
### Q1

The correct answer is **D** because exercising regularly helps with **weight loss**, decreasing **blood pressure** and **reducing blood cholesterol** levels. It also reduces stress. These effects all contribute to reducing the risk of developing coronary heart disease.

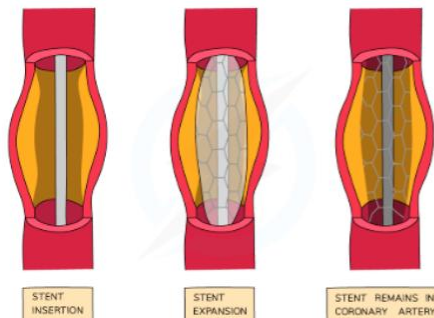
**A** is incorrect as inserting a **stent** (during an angioplasty procedure) is a way of **treating** coronary heart disease (CHD), not reducing the risk. See image below.



**B** is incorrect as **bypass** surgery involves removing part of an artery or vein from another part of the body and using it to reroute blood around a blocked artery. This is a **treatment**, it doesn't reduce the risk of developing CHD.



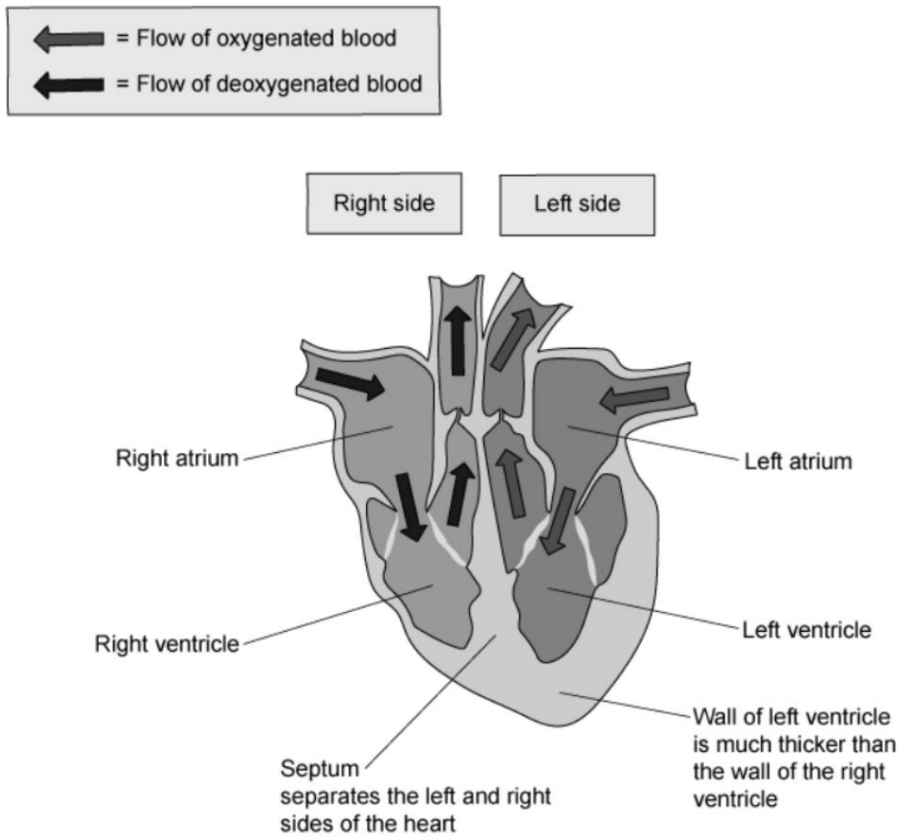
**C** is incorrect as **angioplasty** is the surgical **procedure** in which a tube is threaded up through another blood vessel to the coronary artery, a tiny balloon is then inflated to open up the lumen of the artery and a stent is then inserted to keep the lumen clear. Again, this is a treatment, not a way to reduce the risk.



### Q2

The correct answer is **D** because:

- **Ventricles** have much **thicker** muscle walls than atria as the **atria** are just passing the blood onto the ventricles whereas the ventricles have to generate enough force to push blood out of the heart.
- The left ventricle has a thicker muscle wall than the right ventricle as the **right** ventricle pumps blood to the **lungs**, which are right next to the heart, whereas the **left** ventricle is pumping blood to the entire **body** and so has to **generate a higher pressure** to pump it a greater distance.



The correct answer is **C** because:

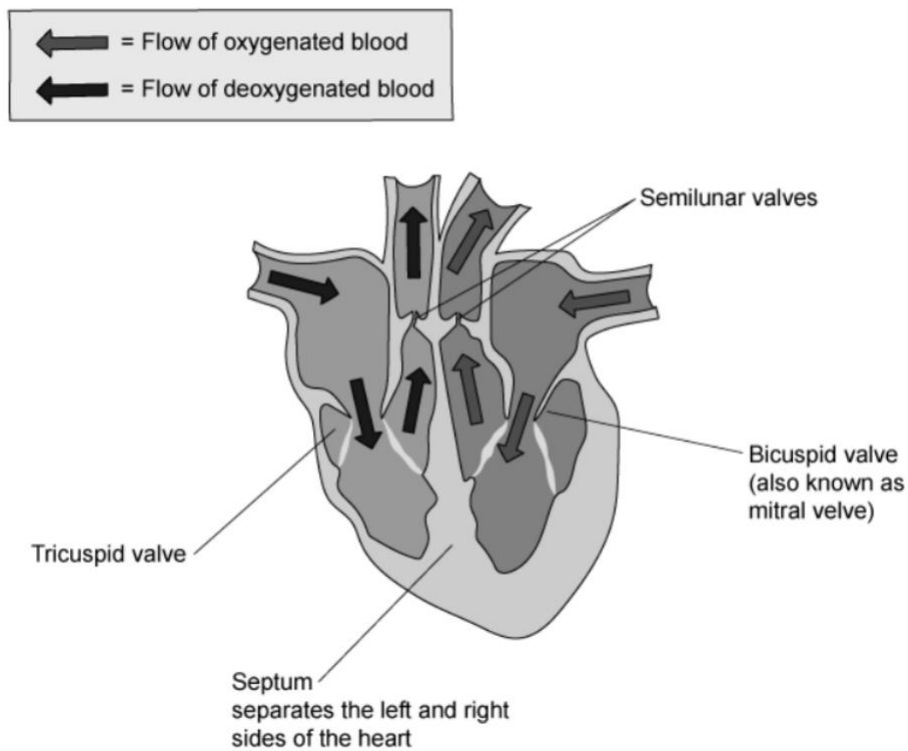
- Humans have a double circulation which means the blood passes through the heart twice for every one circuit of the body.
- Blood is pumped to the lungs and then returned to the heart to be pumped around the body as shown in the diagram below.

<b>A</b> is incorrect as	the whole purpose of the double circulatory system is to increase the pressure of blood being pumped around the body.
<b>B</b> is incorrect as	the pressure generated by contraction of the right ventricle to send blood to the lungs via the pulmonary artery is not as high as the pressure generated by the left ventricle, so as to not damage the delicate capillaries in the lungs.
<b>D</b> is incorrect as	the purpose is not to reduce the pressure of the blood sent to the lungs, and cells need to be delivered to the reactants.

Q4

The correct answer is **B** because:

- **Semilunar** valves are found in the two arteries connected to the heart (the only arteries in the body to contain valves); they prevent the backflow of blood into the heart when it relaxes after contracting.
- The **atrioventricular** (AV) valves are located between the atria and the ventricles; they prevent backflow of blood from the ventricles to the atria when the ventricles contract. The AV valve shown by **Y** in the question image is called the **bicuspid** or **mitral** valve.
- The **septum** separates the two sides of the heart; preventing mixing of oxygenated and deoxygenated blood.



Q5

The correct answer is **C** because veins do not have a pulse. A person's pulse is a measurement of heart rate based upon compression of an artery to feel expansion and contraction of arterial vessels as blood is forced through.

<b>A</b> is incorrect as	veins return blood to the heart which has passed through the capillary network, and against the force of gravity, so blood pressure in the veins is low.
<b>B</b> is incorrect as	almost all veins have valves to prevent the backflow of blood.
<b>D</b> is incorrect as	veins are the blood vessels that connect the capillary network in the tissues of the body with the heart.

Q6

The correct answer is **D** because aspirin **reduces** the clumping action of **platelets** and therefore reduces the chances of **blood clotting** in coronary arteries.

<b>A</b> is incorrect as	as a reduction in pain would not have any effect on reducing the risk of coronary heart disease.
<b>B</b> is incorrect as	as while aspirin does have the ability to reduce blood pressure this is not its primary function in reducing coronary heart disease which is caused by blockages in the coronary arteries.
<b>C</b> is incorrect as	aspirin does not relax the muscles in the walls of the arteries.

Q7

The correct answer is **C** because the lymphatic system is formed from a series of tubes which drain excess tissue fluid from the body. The lymphatic system returns lymph fluid to the circulatory system via a vein near to the heart, where the fluid is added back to the plasma of the blood.

<b>A</b> is incorrect as	the lymphatic system drains excess fluid formed when blood plasma is forced out of the capillaries, it doesn't transport materials to the tissues.
<b>B</b> is incorrect as	the lymphatic vessels transport lymph, which is formed from tissue fluid, back to the circulatory system via a vein.
<b>D</b> is incorrect as	fluid is returned to the circulatory system, not taken to the tissues, via the lymphatic system.

Q8



The correct answer is **A** as:

- The blood in **P** (the left ventricle) is **deoxygenated** and from here will be pumped out of the right side of the heart to the **lungs**.
- As it passes through the lungs it must move through the complex **capillary** networks surrounding the alveoli; as this happens **gas exchange** via diffusion takes place and the blood becomes **oxygenated**.
- It is then returned to the **left** side of the **heart** and collects in **Z** (the left ventricle) before being pumped around the body when the **ventricles** contract.

<b>B</b> is incorrect as	as blood travelling from the heart to the lungs and back to the heart will not go via the digestive system to absorb glucose.
<b>C</b> is incorrect as	blood travelling from the heart to the lungs and back to the heart will not pass through the skin.
<b>D</b> is incorrect as	blood travelling from the heart to the lungs and back to the heart will not go via the head. The blood supply to the head needs to be oxygenated!

Q9

The correct answer is **D** as:

- The vessel can be identified as a vein as it has **valves**, a **large lumen** and **thin** walls.
- The direction of blood flow can be determined by looking at the valves – these are pocket valves which the blood can push through from **T to S** but if the blood flows backwards it will get trapped in the pockets of the valve, which is then forced shut.

Q10

The correct answer is **A** because:

- Cell 1 is a **red blood cell** (not named in the table).
- Cell 2 is a **phagocyte**. Phagocytes have a lobed nucleus, their job is to engulf and destroy foreign material (including pathogens).
- 3 are the **platelets**, fragments of cells that help form clots when blood vessels are damaged.
- Cell 4 is a **lymphocyte**. Lymphocytes have a very large nucleus (this is because they produce antibodies which requires a number of genes to be involved in large-scale protein synthesis).