

The Blood and Circulation

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1

Label the diagram of the heart below

[4 marks]

Pulmonary artery
.....

Right ventricle
.....

Aorta
.....

Left atrium
.....

DON'T FORGET: Label the heart as if it is of the person opposite you. Their left - not yours!

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Explain how blood is moved through the heart. In your answer include how the direction of blood flow is maintained **[4 marks]**

WARNING : this question asks specifically about blood flow through the heart, not the entire body so no need to mention the lungs or capillary beds

Blood enters the atria (through the vena cava and pulmonary vein) [1 mark]
 the atria contract [1 mark]
 which pushes blood into the ventricles [1 mark]
 ventricles contract [1 mark]
 which pushes blood out of the heart /out of the aorta and pulmonary artery [1 mark]
 valves stop blood from flowing backwards or in the wrong direction [1 mark]

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The heart receives a supply of oxygen through arteries. These arteries can become narrowed. Narrowed arteries could cause a heart attack.

One method to treat a narrowed artery is to use a stent

a) Name the arteries that supply oxygen to the heart **[1 mark]**

Coronary arteries [1 mark]

b) Explain how treatment using a stent could prevent a heart attack **[2 marks]**

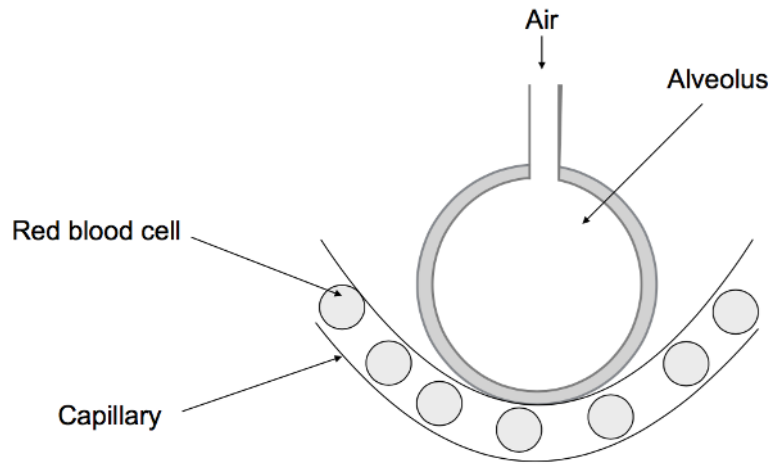
Stent opens the (coronary) artery [1 mark] allowing blood to flow [1]

WARNING : there are other ways to treat narrowed arteries including bypass operations, or taking statins, or reducing cholesterol intake. This question asks specifically about stents. The other answers would be valid if the question asked about how to treat narrowed arteries.

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Below is a diagram of a capillary wrapped around an alveolus in the lungs



- (a) (i) The average number of alveoli in each human lung is 280 million. The average surface area of 1 million alveoli is 0.25m^2 .

Calculate the total surface area of a human lung.

280×0.25 [1 mark]

Answer = 70 [1 mark] m^2

[2 marks]

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- (a) (ii) Red blood cells transport oxygen.

Explain how oxygen is moved from the lungs to the tissues

Oxygen combines with haemoglobin [1 mark]
 to make oxyhaemoglobin [1 mark]
 oxygen/oxyhaemoglobin transported in blood/blood vessels/arteries [1 mark]
 oxyhaemoglobin releases oxygen in tissues or splits to form oxygen and haemoglobin [1 mark]

[3 marks]

- (a) (iii) Complete the table to show the function of the parts of the blood. **[4 marks]**

Part of blood	Function
platelets	Helps to clot the blood [1 mark]
red blood cell	Carries oxygen [1 mark]
plasma	carries carbon dioxide [1 mark]
white blood cell	protects the body from disease [1 mark]