# **Exam Question**

Beta blockers are another type of drug that slows the heart rate. The table shows information for people who do not take beta blockers and for people who do take beta blockers.

- Stroke volume is the volume of blood pumped out of the heart each time it beats.
- Cardiac output is the total volume of blood pumped out of the heart each minute.

	No beta blo	a blockers taken Taking beta b		ta blockers
	At rest	During exercise	At rest	During exercise
Heart rate in beats per minute	68	150	52	88
Stroke volume in cm <sup>3</sup>	80	120	54	98
Cardiac output in cm <sup>3</sup> per minute	5440	18 000	2800	8624

Some people who take beta blockers get out of breath when they exercise. Explain why beta blockers can have this effect during exercise.

You should refer to information given in the table.

[6 Marks]

These type of questions draw on knowledge from other units as well as health & disease & usually involve data

## So what do we know from reading the question?

- Beta blockers slow down heart rate
- Stroke volume = volume of blood pumped out of the heart with each beat
- Cardiac output = total volume of blood pumped each minute
- The table shows a reduction in both cardiac output and stroke volume of those that take beta blockers.

## Now, what do we need to know?

- What are the effects of exercise on our bodies? (faster breathing rate, increased heart rate).
- Why? (increase the rate of respiration, more O<sub>2</sub> needed for the reaction to release energy from glucose, more CO<sub>2</sub> produced and needing to be removed from body).

#### **Model Answer**

During exercise the body needs to transfer more energy, this energy is transferred during respiration. When we exercise the rate of respiration needs to increase to meet the demand, so more  $O_2$  is needed.

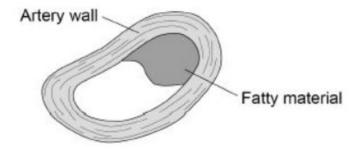
Beta blockers reduce heart rate, so during exercise the beta blockers will reduce the heart rate which reduces the stroke volume and cardiac output. The heart cannot supply  $O_2$  fast enough to meet the demand of the muscle cells. Breathing rate will still increase to increase the amount of  $O_2$  absorbed and increase the amount of CO2 removed from the body but this increased breathing rate cannot fully compensate for the changes (reduction) in the heart function.

### **Exam Question**

Coronary heart disease (CHD) is a non-communicable disease.

CHD is caused when fatty material builds up in the coronary arteries.

The diagram below shows a coronary artery of someone with CHD.



<u>Explain</u> how lifestyle and medical risk factors increase the chance of developing CHD.

[6 marks]



## **Command Word: Explain**

Students should make something clear, or state the reasons for something happening.

Read the question carefully, make sure you identify lifestyle <u>and</u> medical risk factors in your explanation. Make sure you explain how these are linked to CHD.

### **Exam Question**

In a scientific investigation over 44 000 men were monitored for 12 years.

The men were divided into four groups based on their number of hours of physical activity they did per week.

The results are shown in the table.

Group		Х	Υ	Z
Mean number of hours of physical activity per week		5	12	24
Percentage who are smokers		11	9	7
Percentage with high cholesterol		10	11	11
Percentage with family history of heart disease		12	12	12
Mean percentage of fat in diet		33	32	30
Number of cases of heart disease		370	336	294

<u>Evaluate</u> whether the data shows that increased hours of physical activity reduces the risk of heart disease. [6 marks]



#### **Command Word: Evaluate**

Students should use the information supplied, as well as their knowledge and understanding, to consider evidence for and against when making a judgement

# **Exam Questions**

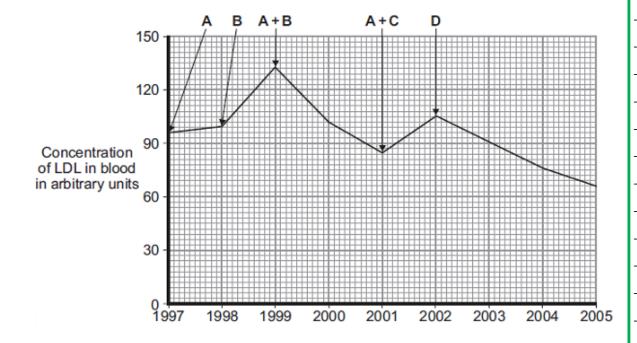
LDL is one form of cholesterol found in the blood.

People with a high concentration of LDL in their blood may be treated with drugs called statins.

A high concentration of LDL cholesterol in the blood may result in an increased risk of heart and circulatory diseases.

The graph shows the effects of the treatment of one person with four different statins, **A**, **B**, **C** and **D**, over a period of 8 years. The arrows show when each new treatment was started.

Each treatment was continued until the next treatment was started



Compare the effectiveness of the five treatments in reducing the risk of heart and circulatory diseases for this person. [6 marks]