Heart Disease
Heart Disease

The circulatory system

What is heart disease?

Preventing heart disease

Summary activities
The heart

The circulatory system is made of the heart and blood vessels. The heart is the organ at the centre of the circulatory system and provides the push that moves blood around the body.

The heart is a double pump:

- The right side of the heart pumps deoxygenated blood to the lungs.
- The left side of the heart pumps oxygenated blood around the body.

The heart is made of cells which need to be supplied with nutrients and oxygen for respiration. The heart therefore has its own blood supply.
Blood vessels

Different types of blood vessel

Press on the label for each type of blood vessel to find out more about its function and structure.
Features and functions

Match each blood vessel to the correct feature and function

- **artery**: contains valves to cope with high pressure
- **vein**: wall only one cell thick to allow diffusion
- **capillary**: thick, elastic wall to prevent blood flowing in the wrong direction
Heart Disease

- The circulatory system
- What is heart disease?
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What is cholesterol?

**Cholesterol** is a lipid found in cell membranes and is used in the production of hormones and bile.

Cholesterol is transported in the blood by molecules called **lipoproteins**, of which there are two types:

- **high-density lipoprotein (HDL)**: often called ‘good cholesterol’
- **low-density lipoprotein (LDL)**: often called ‘bad cholesterol’.

Cholesterol levels depend on diet and genes, but high levels of LDL have been linked to eating lots of saturated fats and few mono/polyunsaturated fats.
Good and bad cholesterol

How does ‘good’ and ‘bad’ cholesterol affect a person’s health?
Cholesterol and heart disease

Why is LDL called ‘bad cholesterol’?
Excess LDL is deposited on the walls of blood vessels, forming **plaque**. This can make arteries narrow, so they are easily blocked by blood clots. If the arteries to the heart become blocked, the heart is starved of oxygen causing a **heart attack**.

Why is HDL called ‘good cholesterol’?
HDL returns cholesterol to the liver where it is broken down (metabolized).

The risk of heart disease may be reduced by:
- lowering blood cholesterol
- eating more HDL than LDL
- gentle daily exercise.
Studying heart disease

Heart disease is the foremost cause of death in the UK. Scientists have studied genetics and undertaken epidemiological studies (looking at trends in statistics about heart disease) to draw conclusions about its causes.

They have found that your genes do affect your risk of heart disease, but your lifestyle choices have a greater effect. Heart disease is rarely caused by micro-organisms.

Heart disease rates are higher in industrialized countries like the UK than in developing countries.

Many experts think this is due to people in richer countries eating more saturated fat and doing less exercise.
Heart disease and global statistics

What trends can you see in world health statistics?

Key
- deaths from heart disease per million deaths:
  - more than 500,000
  - 500,000–100,000
  - 100,000–10,000
  - 10,000–1,000
  - fewer than 1,000
  - no data

Click on the buttons below to select only certain types of country:

- more developed countries only
- high population only
- high obesity only
Deaths from hearth disease in the UK

When a person dies, their cause of death is recorded. This data is collected by the government and used to find patterns.

Can you use this data to spot trends in the death rate from heart disease?

What may happen in the future?
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Preventing deaths from heart disease

Heart disease is caused by:
- lifestyle choices
- genetic factors.

People can reduce their risk of getting heart disease by changing their lifestyle, for example:
- eating a balanced diet low in saturated fat and salt
- taking regular moderate exercise.

It is not possible to reduce your genetic risk, but people who have a history of heart disease in their family should have regular check-ups at the doctor. This allows early symptoms of heart disease to be found and treated quickly.
Risk factors for heart disease

How would these factors affect your risk of heart disease?

increased risk

decreased risk

stress
Illegal drugs

Taking illegal drugs like ecstasy and cannabis can also increase your risk of developing heart disease.

Both drugs increase heart rate and blood pressure, leading to extra strain on the heart.

A US study in 2000 suggested that a person is up to five times more likely to suffer a heart attack in the hour after smoking cannabis than at other times.

Taking illegal drugs is particularly hazardous for people who already have high blood pressure or heart problems.
Doctors often prescribe drugs called **statins** to people with high cholesterol. Statins reduce the amount of ‘bad’ cholesterol in the blood and can reduce the risk of heart attack in patients with high cholesterol by around 40%.

Should these drugs be available without a prescription?

- **Yes! People should be allowed to self-medicate.**

- **No! People with normal cholesterol might take them and they wouldn’t be checked for side-effects like liver damage.**

**What do you think?**
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Glossary of keywords: heart disease

**artery** – A blood vessel that carries blood away from the **heart** at high pressure.

**capillary** – A small blood vessel that carries substances to and from individual cells.

**cholesterol** – A lipid which is carried in the blood and can be deposited in **arteries** when transported by low-density **lipoproteins**.
Heart disease: multiple-choice quiz

Do you have the heart for this summary quiz or has all your learning been in vein?

Press "start" to begin.