7.8 Science as a human endeavour: Things sometimes go wrong in the circulatory system

Student worksheet answers (pages 130–131)

Problems in the circulatory system

Valve disease

1 In which cardiovascular organ does valve disease occur?

Heart

2 What is the cause of valve disease?

Valves become damaged – they may become narrowed from scarring, may leak or may not close properly

3 What are the effects of valve disease?

Damaged valves prevent blood from flowing properly around the body, and therefore less oxygen and nutrients get carried to the cells

4 What is a symptom of valve disease?

Constant tiredness

Atherosclerosis

5 In which cardiovascular organ does atherosclerosis occur?

Blood vessels

6 What is the cause of atherosclerosis?

Narrowing of blood vessels is caused by a build-up of plaque on the inside of the arteries and veins. Layers of plaque (consisting of fat, cholesterol and other substances) are laid down over time.

7 What effect does atherosclerosis have on your body?

The plaque hardens and restricts blood flow. If in the heart, this causes a heart attack.

Coronary heart disease

8 In which cardiovascular organ does coronary heart disease occur?

Heart

9 What is the cause of coronary heart disease?

Fatty deposits blocking important blood vessels in the heart

10 What effect does coronary heart disease have on your body?

Can cause a heart attack when blood vessels become completely blocked or a bit of the fatty deposit breaks off and travels into the heart. Heart muscle cells may be killed in the process.

11 What is the best way to avoid coronary heart disease?

By eating less fatty foods and exercising regularly

Pericarditis

12 In which cardiovascular organ does pericarditis occur?

Heart

13 What is the cause of pericarditis?

The pericardium, the thin layer of cells surrounding the heart that allows it to beat easily, becomes infected by bacteria and causes it to fill with liquid

14 What effect does pericarditis have on your body?

The heart cannot beat properly as it cannot completely fill with blood

15 What is the treatment for pericarditis?

Antibiotics are needed to kill the bacteria

Extend your understanding

16 Choose one of the four cardiovascular conditions below and answer the following questions:

Cardiomyopathy Angina High blood pressure High cholesterol

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Cardiomyopathy** | **Angina** | **High Blood Pressure** | **High Cholesterol** |
| a In which cardiovascular organ does the condition occur | Heart | Heart | Heart | Heart, vessels and digestive system |
| b What is the cause of this condition? | Heart muscle becomes inflamed or enlarged | Narrowing of arteries results in decreased blood flow and oxygen to the heart | The blood pumps at a higher pressure when arteries become more rigid and less elastic | Too much cholesterol in the blood causes fatty deposits to build up in blood vessels, which makes it harder for blood to flow through |
| c What effects can this condition have on your body? | Heart muscle stretches and becomes weak, and it cannot pump blood as fast  Heart failure results | Causes chest pain or discomfort  Causes heart attack and death | Added stress to arteries speeds up their clogging and results in heart attack, kidney failure or stroke | Causes a heart attack or stroke |
| d What is the treatment? | Surgery or medications such as:  • fluid pills to remove excess fluid  • beta-blockers to reduces the heart’s workload  • digoxin to regulate an abnormal heart rhythm | Lifestyle changes, medications, medical procedures, cardiac rehabilitation, and other therapies  Main goal is to reduce pain and prevent heart attacks | Medication to remove excess fluid and salt from body, to help the heart beat slower and to increase elasticity of vessels | Medication to lower blood cholesterol absorption |
| e Is there any way to manage the condition to avoid it happening again or to limit ongoing effects? | No cure  Effects can be reduced by quitting smoking, eating less salt, limiting alcohol and exercising more | Prevention by lifestyle changes  Take rest breaks, avoid heavy meals, manage stress, be smoke-free, be physically active, maintain a healthy body weight | No cure  Prevention by lifestyle changes  Manage stress, limit alcohol, maintain healthy weight, exercise, eat healthy foods | No cure, only lifestyle changes  Be smoke-free, limit alcohol intake, achieve and maintain a healthy body weight, be active every day |