BIOLOGY IN ENGLISH

Blood vessel deterioration results in cardiovascular disease

Especially when we are children, the cardiovascular disease is the leading cause of untimely death in western countries, where it is estimated that about 20% of the population suffers from **hypertension**, which is high blood pressure. Hypertension is sometimes called a silent killer because it may not be detected until a stroke or heart attack occurs.

Heredity and lifestyle contribute to hypertension. For example, hypertension is often seen in individuals who have **atherosclerosis**, which occurs when plaque protrudes into the lumen of a vessel and interferes with the flow of blood. Plaques are made up of fat, cholesterol, calcium, and other substances flowing in the blood; over time, plaques harden and narrow the arteries, limiting the flow of oxygen-rich blood to organs. Usually, atherosclerosis begins in early adulthood and develops progressively through middle age, but symptoms may not appear until an individual is 50 or older.

STROKE, OR CEREBRAL ICTUS

Atherosclerotic plaque can cause a blood clot to form along the irregular arterial wall. As long as the clot remains stationary, it is called a *thrombus*, but when and if it dislodges and moves along with the blood, it is called an *embolus*. If *thromboembolism* is not treated, serious health problems can result.

A cardiovascular accident, also called a **stroke**, often occurs when a small cranial arteriole bursts or is blocked by an embolus. Lack of oxygen rapidly causes a portion of the brain to die, and paralysis or death can result. A person is sometimes forewarned of a stroke by a feeling of numbness in the hands or the face, difficulty in speaking, or temporary blindness in one eye. If a coronary artery becomes completely blocked due to thromboembolism, a heart attack can occur, as described next.

HEART ATTACK

The coronary arteries bring O_2-rich blood from the aorta to capillaries in the wall of the heart, and the cardiac veins return O_2-poor blood from the capillaries to the right ventricle. If the coronary arteries are narrow due to cardiovascular disease, the individual may first suffer from *angina pectoris*, chest pain that is often accompanied by a radiating pain in the left arm. When a coronary artery is completely blocked, a portion of the heart muscle dies due to lack of oxygen. This is known as a **heart attack**; if blood flow isn't restored quickly, the section of heart muscle begins to die.

Diverse surgical procedures are possible to correct a blockage or facilitate blood flow (**figure 1**). In a *coronary bypass* operation, a portion of a blood vessel from another part of the body is sutured from the aorta to the coronary artery, past the point of obstruction (**figure 2**, left); the surgery uses a piece of a vein from the leg or artery from the chest or wrist. Now blood flows normally again from the aorta to the wall of the heart. In *balloon angioplasty*, a plastic tube is threaded through an artery to the blockage, and a balloon attached to the end of the tube is inflated to break through the blockage. In other cases, a *stent* is often used to keep the vessel open.

ANSWER

Which are the differences between strokes and heart attacks?

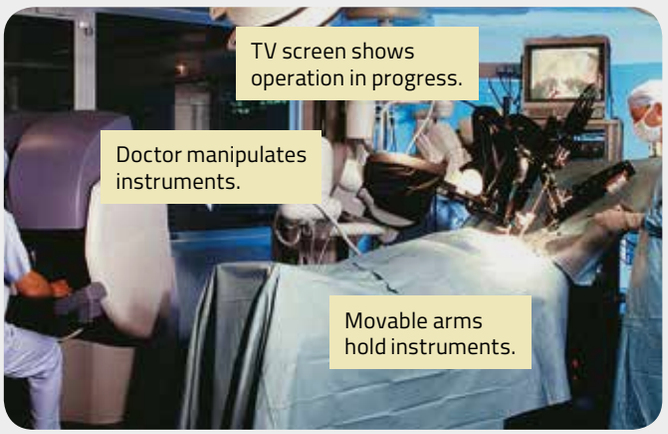

Figure 1 Treatment for clogged coronary artery: cardiologists can follow and control their intervention in a monitor.

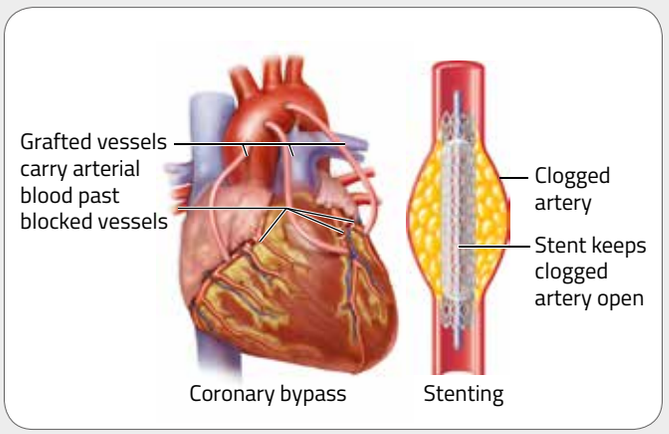

Figure 2 Two systems for recover the blood flow in the coronary arteries.