targets the underlying causes, as well as supports the cardiovascular system while that cause is treated. Signs and symptoms of shock affect every portion of the body. In the early stages, the metabolism slows, causing the temperature to drop and the patient to complain of thirst. The skin becomes cold, clammy, and pale. Urine output diminishes because of the lack of circulating blood volume. As blood pressure lowers, the patient's heart rate becomes rapid and thready as the heart attempts to pump more blood to the periphery. Respirations become rapid and shallow. The patient experiences anxiety, confusion, lethargy, and restlessness because the lack of oxygen and blood affect the brain. If the process is not reversed, the heart will eventually stop pumping, and the patient will die.

Drug therapy for shock includes IV vasopressors such as epinephrine, norepinephrine (Levophed), and dopamine (Intropin) to increase blood pressure and inotropic drugs such as dobutamine (Dobutrex) to strengthen the contraction of the heart and increase cardiac output. In addition, IV antibiotics are used to treat the infection that caused septic shock, and plasma expanders such as albumin human (Albutein) may be administered by the IV route in the treatment of hypovolemic shock.

Anaphylactic shock is another type of shock caused by the body's overactive response to a threat such as an allergen. Signs and symptoms include breathing difficulty, bronchoconstriction, decreased cardiac output, edema, increased heart rate, hives, itching, and vasodilation. It is treated with the vasopressor epinephrine (EpiPen). Patients with life-threatening allergies are advised to carry their EpiPens with them at all times and administer an injection as needed. Epinephrine can also be given via injection or by the IV route by a health-care professional.

MEDICATIONS FOR LIPID DISORDERS

Many Americans have a diet that is high in fat. Excess fat can be deposited on or in the walls of the blood vessels to cause **hyperlipemia.** Plugged vessels can lead to atherosclerosis, hypertension, and CHF.

Not all lipids or fats are the same. **High-density lipoproteins (HDLs)** act as street sweepers and clean out blood vessels. **Low-density lipoproteins (LDLs)** are more like snowflakes, depositing fat in the vessels. **Very low-density lipoproteins (VLDLs)** are the worst fats. Because they are so small, they actually wedge themselves inside the blood vessel walls and are difficult to clear.

You can help your patients by teaching them about nonpharmacological approaches for managing lipidemia, such as those mentioned in Fast Tip 16.4.

Some patients' lipid and cholesterol levels remain elevated even after making dietary and lifestyle changes. These patients have a high genetic risk factor regardless of lifestyle. For these patients, HMG-CoA (3-hydroxy-3-methyl-glutaryl-coenzyme A) reductase inhibitors, commonly referred to as statins, decrease blood levels of lipids. These drugs encourage the liver to make less cholesterol and increase the number of LDL receptors in the liver. Increased LDL receptors grab the circulating LDL from the blood. Examples of HMG-CoA reductase inhibitors are atorvastatin (Lipitor), cerivastatin (Baycol), fluvastatin (Lescol, Lescol XL), lovastatin (Altocor, Altoprev, Mevacor), pitavastatin (Livalo), pravastatin (Pravachol), rosuvastatin (Crestor), and simvastatin (Zocor).

In patients who have very high cholesterol levels, these medications are often not sufficient and require the help of bile acid sequestrants to decrease serum lipid levels. Bile acid sequestrants such as cholestyramine (Questran, Questran Light, Prevalite, Cholestyramine Light, Locholest, Locholest Light), colesevelam (Welchol), and colestipol (Colestid, Colestid Flavored) lower LDL blood levels by forming complexes with bile acids and thus cause the liver to make more bile acids from cholesterol.

Fibric acid derivatives such as fenofibrate (Antara, Fenoglide, Lipofen, TriCor, Triglide), fenofibric acid (Tilipix, Fibricor), and gemfibrozil (Lopid) are used mainly to lower triglyceride levels by inhibiting

Fast Tip 16.4 Nonpharmacological Treatment of Lipidemia

Nonpharmacological ways to decrease lipids include smoking cessation, decreasing dietary fats and cholesterol, avoiding stress, exercising, maintaining a healthy weight, and periodic blood cholesterol screening to gauge the patient's success.