Lipoproteins—The Good, The Bad, and The Ugly

There is much ado about fats these days. Trans fats, saturated fats, unsaturated fats, monounsaturated fats, partially hydrogenated vegetable oil, fish oils, fatty acids, cholesterol, triglycerides, high-density lipoproteins, low-density lipoproteins, . . . what’s all the fuss?

While too little fat in our diets can be harmful (it reduces fat-soluble vitamin absorption and availability of essential fatty acids), too much often proves detrimental to cardiovascular health.

Cholesterol, a soft, waxy substance, is the most well-known and abundant lipid-steroid-alcohol compound found in the bloodstream as well as in all the cells of the body. Cholesterol is essential to help build the body’s cells and certain hormones, but excess blood cholesterol (hypercholesterolemia) increases the risk of developing coronary artery disease (heart disease).

The main dietary source of cholesterol is from animal products such as milk, butter, meat, and fish. Dietary fats are absorbed in the intestinal tract and then travel through the bloodstream to the liver. The liver is responsible for keeping the body tissues supplied with the cholesterol and triglycerides necessary for proper function. After a meal, the liver collects cholesterol and triglycerides from the bloodstream and combines them with special proteins into tiny particles called lipoproteins. The liver then frees the lipoproteins to travel through the body via the bloodstream, delivering lipids where they are needed. According to the American Heart Association, the liver itself produces approximately 1000 mg of cholesterol each day, and another 200–500 mg can be ingested through our diet. The liver produces all the cholesterol the body needs to function properly. The cholesterol is then transported throughout the body by either high-density lipoproteins (HDLs) or low-density lipoproteins (LDLs).

Low-Density Lipoproteins: The Bad (and Ugly) Cholesterol

Most blood cholesterol (66%–75%) is transported by LDLs. Cholesterol does not dissolve in blood, so unneeded cholesterol continues to circulate in the bloodstream. Eventually, the circulating LDL cholesterol is altered physically and chemically as it becomes exposed to oxygen in the blood (it becomes oxidized). Oxidation causes the LDL particles to become smaller and denser, allowing them to pass through arterial walls and accumulate under the lining of blood vessels. These thick, hard accumulations of LDLs called plaques consist of cholesterol, fatty acids, dead cell fragments, and salts of calcium and other minerals. Within the arterial walls, the plaques cause inflammation, which narrows the diameter of the artery and reduces its flexibility, hindering healthy blood flow. If a blood clot forms or unstable plaque breaks away and blocks a narrowed artery, oxygen is unable to reach the heart and brain, and a heart attack or stroke can occur.
High-Density Lipoproteins: The Good Cholesterol

The American Heart Association notes that recent research suggests that high levels of HDL appear to lower the risk of heart attack and stroke. HDLs are believed to have a scrubbing effect on arterial walls, removing cholesterol from accumulated plaques and transporting it away from cells and arteries to the liver, where it is then eliminated from the body. HDLs may also benefit the cardiovascular system by their antioxidant, anti-inflammatory, and anti-clotting properties.

Here are some suggestions for increasing HDLs:

- Participate in regular aerobic exercise such as biking, swimming, jogging, and brisk walking.
- Lose weight if you are above your recommended body mass index (BMI). Many websites offer free BMI calculators; see how you “weigh in.”
- Replace trans fatty acids, partially hydrogenated oils, and saturated fats (found in animal products and processed foods) with monounsaturated fats such as cold-pressed, or expeller-pressed, olive oil, canola oil, soybean oil, flaxseed oil, avocado oil, and peanut oil.
- Increase dietary intake of fresh or frozen cold-water fish, whole grains, raw seeds and nuts, dark green leafy vegetables, and vegetable oils. These and monounsaturated fats contain heart-healthy essential fatty acids.

Cholesterol-lowering medications are available by prescription if the above-mentioned methods fail. Being thin and feeling healthy does not necessarily mean you do not have a cholesterol problem. Schedule annual physical examinations with your doctor to be sure you are as healthy as you feel!