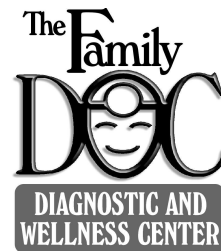


# BLOOD LIPIDS (CHOLESTEROL)



Blood lipids include cholesterol and triglycerides. Cholesterol is a substance that is an important building block of several important things in the body, including brain cells, and hormones such as estrogen and testosterone. Triglycerides are the way that fats are transported in the bloodstream, to move them from one part of the body to another (like from the liver to the fat cells for storage).

When blood cholesterol is elevated there is “too much of a good thing”, and problems occur, specifically, the development of blockages in the arteries in the body, especially in the heart and neck. These blockages can ultimately lead to heart attacks and strokes when blood clots form at the site of the blockages, preventing blood flow through the artery, or when pieces of the blockages and/or clots break off and go on to completely occlude smaller blood vessels downstream from the blockages.

Cholesterol and triglycerides do not float around “loose” in the blood, but are combined in packages called LIPOPROTEINS, a word you probably will be hearing more about in the future, as lay people gradually become more aware of the whole cholesterol story. (Many people are already familiar with LDL and HDL – low density lipoproteins and high density lipoproteins, – the “bad” and “good” “cholesterol” respectively. As we shall see, not all high density lipoproteins are “good”.) These lipoproteins are composed of a core of cholesterol and triglycerides encased in an outer shell. They come in different sizes, from small to large (with the smallest ones being the worst for forming blockages in the arteries), and in different densities from very low density to high density, becoming less dense as the lipoprotein particle contains more triglyceride, and relatively less cholesterol, that is, as the content of triglycerides goes up the density goes down. The low density ones are the worst for forming blockages. However, it has been determined within the past few years that the small high density lipoproteins (small HDL) also increase cardiovascular risk. Only the large HDL particles are the “good” ones.

Although the size and density of lipoprotein particles are important, it turns out that the *number* of lipoprotein particles circulating around in the blood is the single *most important* determinant of the risk of developing blockages in the arteries. If there are hardly any LDL particles floating around, it really doesn’t matter how big or how dense they are, since there are not enough of them to pose a problem. If there are a large number of LDL particles, that is bad, regardless of how much *total* LDL there is, and it becomes more important to eliminate the small, low density ones, as well as to get the number of particles down.

It has not been possible in the past to measure the *number* of these lipoprotein particles for everyday clinical purposes, or to easily determine their relative size or density distribution. Now it is possible. There is a relatively new company in Raleigh, named Liposcience, that can do this quickly and relatively inexpensively. This technology is not widely available yet, but will probably become the standard for lipid determination within a few years. We are already using this technology at The Family Doc to provide better risk assessment than that provided by the standard lipid profile.

All of the abnormalities that can be found using the Liposcience lipoprotein profile are treatable with various medications, although different abnormalities require different medications. Although these medications are relatively safe, they can cause rare problems, including irritation of the liver and of the muscles. For this reason it is important to monitor a person’s liver and muscles if they are taking a cholesterol medicine (using periodic simple blood tests), and to stop the medication if signs of significant liver or muscle irritation develop. If this is done there is generally no permanent damage done even if some irritation develops. As time goes on, this monitoring needs to be done less frequently, since irritation usually shows up in the early stages of treatment, if it shows up at all.

The treatment of lipoprotein problems involves modifying ones diet, and taking cholesterol lowering drugs. Generally, either a low fat or a low carbohydrate diet will work to lower lipids. What *doesn't* work is a diet with a moderate to high level of *both* fats and carbs. Taking the drugs alone, without modifying the diet, is insufficient. In addition, there are several over the counter things that can be taken to reduce the risk of heart attacks and strokes from artery blockages. These include: aspirin, one tablet a day (as long as you don't have any medical problem that would preclude you taking aspirin - like stomach ulcers; ask us to be sure it's OK before you start taking aspirin); folate (folic acid), 1 mg per day; vitamin C, 1000 mg a day; vitamin B complex, one tablet a day; and possibly vitamin E, 400 units a day (although whether this is beneficial or not is not yet clear). We may also recommend that you take OTC niacin (vitamin B3) to treat your elevated lipids. In addition, if the lipoprotein profile is abnormal, it is even more important to control other major risk factors for heart attacks and strokes, especially diabetes, high blood pressure and smoking.