



# Cholesterol Myths

THOUGHT YOU KNEW EVERYTHING ABOUT CHOLESTEROL? PERHAPS YOU SHOULD THINK AGAIN.

By MATT FITZGERALD

**T**here is a strong tendency in our diet-obsessed culture to label some nutrients “good” and others “bad.” Antioxidants and protein, for example, are generally considered good. Fat, sugars and cholesterol are generally regarded as bad.

The reality is more complex, however. By definition, all nutrients are useful to the human body in one or more ways, and most are downright essential. Nutrients only become bad when they are consumed in excess.

Cholesterol could well be the most vilified nutrient of all time. The very word “cholesterol” conjures up associations with obesity, disease, heart attacks and death. As a result, foods high in cholesterol are avoided like poison. Particularly in the face of the recently lowered cholesterol-treatment guidelines, high blood-cholesterol levels may motivate desperate corrective actions.

In truth, though, many of our preconceptions about cholesterol are based on pervasive misinformation and myth, and some of the actions we take based on these misconceptions can be counterproductive. It may be a while before anyone gets the whole cholesterol story straight, and far longer before everyone agrees on all the details. Here, you’ll find just five of the most common cholesterol myths — and a few of the truths they obscure. As always, check with your own healthcare professional before making any significant changes to your current diet and medication regimen.

## Myth No. 1: Cholesterol is just plain bad for the body

CONTRARY TO POPULAR BELIEF, cholesterol is actually vital for human life and health. Technically a type of alcohol, cholesterol is water insoluble, which allows it to serve as a stable ingredient in a variety of structures within the body. Cholesterol is a component in the membrane of every living cell, preventing the cell’s contents from leaking out and keeping harmful chemicals outside the cell from getting in. It plays a role in forming several key hormones as well as synapses, the circuitry through which nerve cells communicate.

“Cholesterol is also an important repair substance,” notes Mary Enig, PhD, a biochemist and the author of *Know Your Fats* (Bethesda Press, 2000). “When the body has an infection or inflammation or wound, cholesterol is concentrated in the areas that are getting healed.” In other words, it’s possible that the presence of cholesterol may be an indicator of inflammation rather than a root cause.

Because cholesterol is essential to so many functions, inadequate cholesterol levels may lead to a number of health problems, including depression. A Finnish study of men between the ages of 50 and 69, published in the *British Journal of Psychiatry*, found that those reporting depression had significantly lower blood cholesterol levels than those who were not.

It’s possible the correlation exists because of the role cholesterol plays in the metabolism of serotonin, an important mood-regulating chemical in the brain that is lower in people with low cholesterol.

In addition to causing health problems, abnormally low cholesterol levels are frequently an indication of serious infirmities. These include overactive thyroid gland, liver disease, anemia, malnutrition, cancer and poor absorption of foods from the digestive tract.

The good news is that abnormally low cholesterol levels are rare, because a healthy liver can manufacture all the cholesterol we need. Furthermore, only a fraction of cholesterol consumed in foods is actually absorbed into the body.

What about the much-hyped distinction between “good” cholesterol and “bad” cholesterol? These labels, too, are a bit simplistic. High-density lipoproteins (HDL, or “good” cholesterol) and low-density lipoproteins (LDL, or “bad” cholesterol) are actually not cholesterol at all; they are the fat molecules that transport cholesterol through the bloodstream.

LDL is responsible for shuttling cholesterol from the liver (where it is made) through the bloodstream and then depositing it in the tissues where it’s needed. HDL transports cholesterol from the tissues back to the liver, where the majority of it is secreted in the bile that is used to break down food. What’s more, both HDL and LDL are indispensable. In the proper ratios, both are good. The reason LDL is called “bad” is that a too-high ratio of LDL to HDL cholesterol in the blood is associated with a higher risk of coronary heart disease. But make no mistake: You couldn’t live without LDL.

## Myth No. 2: High blood cholesterol is caused by eating too much fat and cholesterol

THE THEORY THAT there is a direct relationship between the amount of saturated fat and cholesterol in one's diet and the incidence of high blood pressure and coronary heart disease (CHD) is known as the "lipid hypothesis" — and it's hotly debated.

While some saturated fats (particularly animal fats) do appear to negatively impact lipid blood profiles, there's a lot more to the diet-and-heart-disease connection. We know, for example, that the old concept of cholesterol coating or clogging the arteries is a flawed one (see Myth No. 4), and that (when eaten in moderation) eggs and red meat needn't be off limits to cholesterol-concerned persons.

Saturated fat does appear to raise LDL by down-regulating LDL receptors in the liver, which are then cleared out of the bloodstream more slowly. On the other hand, it also raises "good" HDL. The most important thing to remember is that cholesterol levels and heart-disease risk are affected to a much greater degree by a combination of other dietary factors:

- **Trans-fatty acids** raise LDL and lower HDL and thus have a worse effect than saturated fats on the overall cholesterol ratio. Also, the medium-chain fatty acids in some plant-based saturated fats (like coconut oil) appear *not* to be implicated in raising cholesterol.
- **Monounsaturated and other healthy fats** (like those found in nuts, fish, olive oil and avocados) *increase* the activity of LDL receptors in the liver and thereby lower LDL levels in the blood.
- **Overeating and underexercising** raise cholesterol levels by increasing abdominal fat stores. Abdominal fat also decreases insulin sensitivity, causing excess glucose to accumulate in the bloodstream and exacerbate the formation of arterial plaques.
- **B-vitamins** (especially folate) reduce blood levels of homocysteine, an intermediate in amino acid metabolism. Elevated homocysteine levels are an important risk factor for CHD.
- **Plant sterols and stanols** (the plant equivalents of cholesterol) reduce cholesterol levels by blocking cholesterol absorption, as does dietary fiber. (For more on sterols, see the Jul./Aug. 2004 issue of *Experience Life*.)
- **Antioxidants** do not reduce cholesterol levels but, just as important, they do reduce the oxidation of LDLs in the bloodstream.

Based on these dietary facts, it's safe to say that the problem is not so much that we are eating too much saturated fat but that we're eating too much food — period. And yet we're still not eating enough fruits, vegetables, nuts and whole grains — which are some of the best sources of monounsaturated fats, B-vitamins, fiber, plant sterols, plant stanols and antioxidants.

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## Myth No. 3: A cholesterol level above 200 is too high

DETERMINING WHAT CONSTITUTES an unhealthy cholesterol level is probably the most confused and controversial aspect of current science on the subject. The National Heart, Lung, and Blood Institute still uses the following guidelines:

	LDL Cholesterol	Total Cholesterol
Desirable	Less than 130 mg	Less than 200 mg (ideally 180)
Borderline High	130–159 mg	200–239 mg
Too High	160 mg and above	240 mg

However, the National Cholesterol Education Program Adult Treatment Panel recently published new, lower guidelines recommending that LDL levels be brought below 100 mg for high- and moderate-risk patients.

Even the less aggressive guidelines have been attacked on a number of fronts. So-called cholesterol skeptics believe that the numbers are simply irrelevant. "A total cholesterol level of 200 is normal," says Enig. "For some individuals, two hundred twenty is normal. For others, 240 and even 260 is normal." Enig and others base their views on the fact that many studies have established a less-than-airtight connection between high cholesterol levels and heart disease.

For example, in the famous Framingham study, which is considered the cornerstone of the cholesterol-CHD connection, the "correlation coefficient" between high cholesterol and coronary heart disease was only 0.36 — about half of that between smoking and lung cancer.

Some researchers even believe that relatively high cholesterol levels may actually *prevent* coronary heart disease by defending against the infections that may contribute to atherosclerosis. Uffe Ravnskov, a well-known cholesterol skeptic and author of *The Cholesterol Myths* (New Trends, 2000), recently presented evidence for this case in the *Quarterly Journal of Medicine* (Dec. 2003). And in a University of Hawaii study, men over age 70 were much more likely to develop heart disease if their total cholesterol level was *below* 200 than if it was between 200 and 219.

Another problem for the most common cholesterol guidelines is that elderly people (and especially women) with moderately high cholesterol levels tend to be healthier than their peers with lower levels. In the Framingham study, although individuals with high cholesterol were more likely to die from CHD, their *overall* mortality rate was actually lower than that of individuals with lower cholesterol.

What's more, there is now growing evidence that the *quality* of LDL particles is as important as their number. Some are big and fluffy and less likely to deposit in an arterial wall. Others are small and dense and are more likely to get trapped. "If two people have borderline cholesterol and one has a good profile [i.e., good-quality particles] and one has a bad one, I would be much more inclined to treat the bad one," says William Kraus, MD, of Duke University.

Kraus has conducted experiments demonstrating that moderate exercise improves the quality of LDL particles. It has long been known that exercise reduces the risk of CHD without directly lowering LDL levels (although it does lower them indirectly by inducing weight loss). →

## Myth No. 4: Cholesterol is the root cause of coronary heart disease (CHD)

YOU MIGHT THINK that all doctors agree on this assertion. You'd be wrong. In fact, it is a point of enormous contention and debate. "The majority of the risk [for coronary heart disease] is *not* explained by cholesterol," says Jeffrey Anderson, MD, a cardiologist and professor of medicine at the University of Utah. The old belief — still widely held by many opinion leaders of medical science — was that cholesterol coated and clogged arteries, which in turn caused potentially fatal problems such as heart attacks and strokes. The real story is not so simple.

"What we've learned in recent years is that the problem is not just passive infiltration of cholesterol, but the fact that it provokes an inflammatory/immune process," Anderson explains. "Some people have a greater inflammatory process going on than others. We're still trying to track down the factors that make one group prone to this and others less so."

Here's what's known: Low-density lipoproteins are small particles, and those that are especially small can infiltrate the lining of an artery and get deposited in its wall. There are a number of reasons cholesterol might end up there, including preceding damage to the artery caused by infection, previous inflammation or the presence of free radicals.

Some of the LDL that does get trapped in artery walls can then get oxidized (i.e., damaged) by any number of factors and then provoke a complex (secondary) inflammatory response. These trapped fats are subsequently ingested by the immune system's white blood cells, which accumulate (along with fibrous material, calcium and other substances) within the artery wall. Over the years, these areas of accumulation form scab-like plaques, which partially or even completely block the artery. This condition is known as atherosclerosis. Either a complete blockage or a ruptured plaque can cut off blood supply to the heart or brain, resulting in a heart attack or stroke.

The important point here is that high LDL levels *alone* are not sufficient, nor even necessary, for atherosclerosis to develop. Atherosclerosis is common in individuals with low LDL levels as well, perhaps because there is a disproportionate number of small LDL particles or because too many are being oxidized. Likewise, individuals with high LDL levels often have perfectly healthy arteries, because one or more of the many other causes of plaque formation are not a contributing factor.

As is the case with many other diseases, genetic predisposition is one of the main culprits in causing CHD. Some of us are simply more prone to high LDL levels, LDL oxidation, easily damaged arteries and blood clotting. Other strong predictors of CHD are family history of the disease, high blood pressure, diabetes and smoking. (Stress and anger are weaker, but still significant, predictors.)

## Myth No. 5: Statin drugs like Lipitor prolong life by lowering cholesterol

WIDELY REGARDED as wonder drugs, statins slow cholesterol production in the liver. More than 20 million Americans now take them, and the statin Lipitor is the most prescribed cholesterol-lowering medicine in the world. It's interesting to note that while statins lower LDL in everyone, though, they slightly lower coronary heart-disease death rates only in middle-aged men who already have CHD or are at high risk for it. When it comes to women, the elderly, and middle-aged men at a lower risk of CHD, "there isn't even a trend toward total mortality benefit," says Beatrice Golomb, MD, PhD, of the University of California, San Diego.

Worse, statins cause a number of side effects, which Golomb is currently studying. "The most common side effects associated with the statins are muscle pains and weakness, fatigue, deteriorating cognitive function, liver toxicity and neuropathy [pain from damaged nerves]," she says. "The problems in some cases can be very serious, with some people actually losing the ability to walk."

These problems are probably due to the fact that statins lower the level of coenzyme Q10, a vitamin-like nutrient that plays a pivotal role in providing energy to the muscles and brain. Golomb feels that middle-aged men at high risk for CHD should still try statins, but they should be aware of the risks and be prepared to get off the drugs if side effects emerge.

### SO, WHAT NOW?

Clearly, science has a way to go before we have the full story on cholesterol, to say nothing of its connections with inflammation and oxidation. But it seems increasingly evident that cholesterol must be considered in a wider context than previously understood. In the meantime, the old commonsense rules apply: Eat a balanced diet based in whole foods, exercise as vigorously as your health allows, maintain a healthy body weight, limit stress, seek your doctor's advice on lipid and inflammation testing, and take prescribed drugs only as needed. ●

Matt Fitzgerald is a freelance writer based in San Diego.



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