

All About Cholesterol

by Jon Caswell

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“The lower the better for high-risk people — that’s the message on bad (LDL) cholesterol from recent clinical trials,” said Scott Grundy, MD, PhD. Dr. Grundy, who is director of the Center for Human Nutrition at UT Southwestern Medical Center in Dallas, was commenting on updated recommendations from the National Cholesterol Education Program (NCEP). The NCEP guidelines released this summer urge more intensive cholesterol treatment for people at high risk for heart attack and death from cardiovascular disease. September is National Cholesterol Awareness Month.

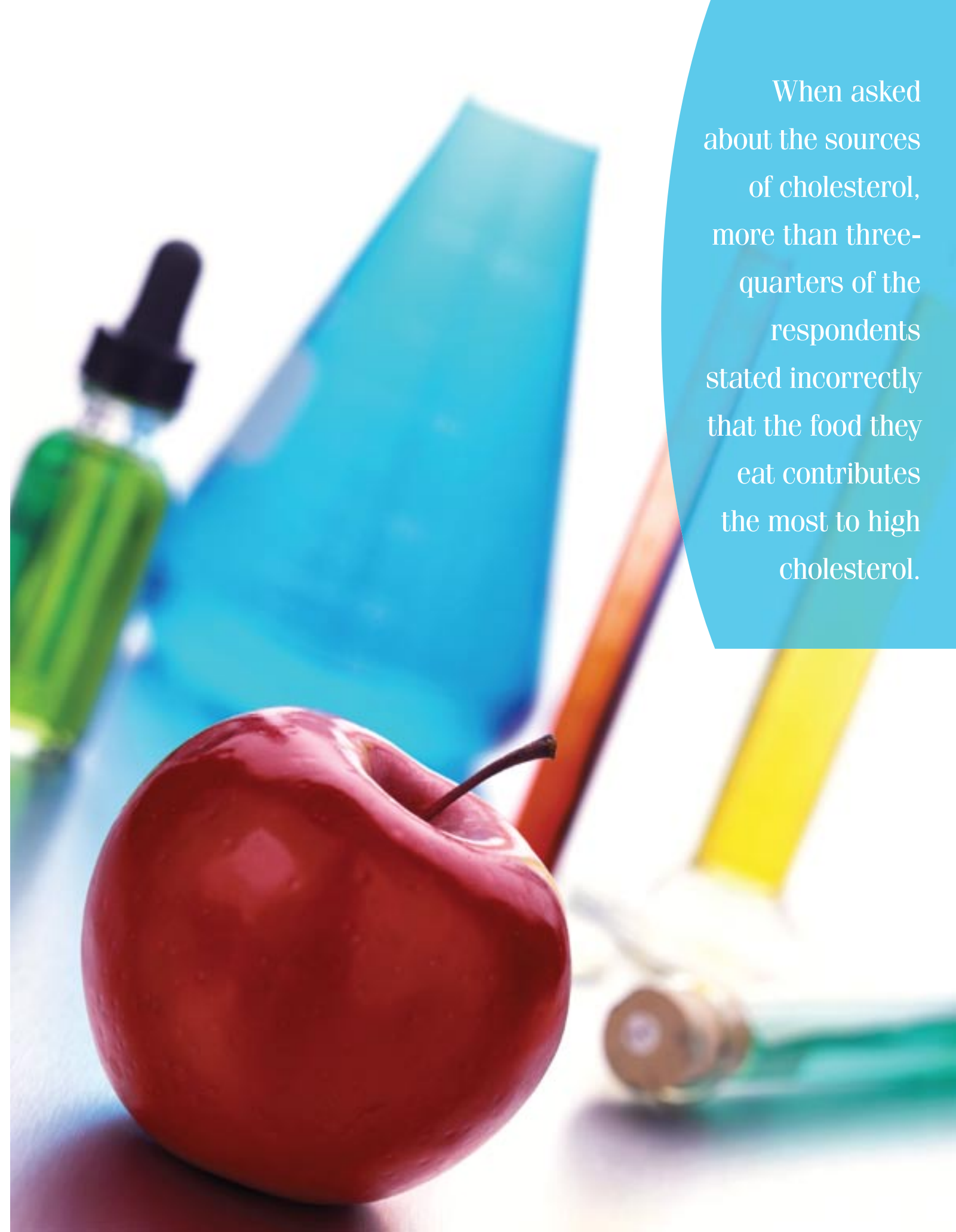
Previous guidelines from the Adult Treatment Panel (ATP) of the NCEP in 2001 had recommended reducing LDL cholesterol below 100 mg/dL for high-risk patients. However, after examining five major clinical trials involving cholesterol-lowering medications, the panel concluded that those at high risk could benefit from even lower LDL numbers, below 70 mg/dL. This updated recommendation means that high-risk patients may still be considered for cholesterol-lowering drug therapy, even if their cholesterol is below 100.

Another set of numbers relevant to the discussion about lowering LDL cholesterol was also recently published. Simultaneous to the announcement of the national guidelines, Mended Hearts, in conjunction with Merck/Schering-Plough Pharmaceuticals, released the results of a nationwide survey indicating an alarming knowledge gap in patients’ understanding of cholesterol.

When asked about the sources of cholesterol, more than three-quarters (77 percent) of the respondents (representing more than 1,000 patients reported as having high cholesterol) stated incorrectly that the food they eat contributes the most to high cholesterol. In fact, the cholesterol in the bloodstream is not just absorbed from food, but the majority is produced naturally in the body. The fact that there are two sources of cholesterol helps explain why some people may not be able to reduce their cholesterol level no matter what they do with their diet and other lifestyle factors.

Mended Hearts has joined with Merck/Schering-Plough to foster patient awareness of *all* factors contributing to high cholesterol. While continuing to emphasize that patients follow a heart-healthy lifestyle with diet, weight management and physical activity, Mended Hearts also encourages informed patients to discuss with their doctors the cholesterol-lowering approach that is best for them.

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“The fact is that both diet and heredity play a critical role in your cholesterol levels in your blood,” said Dr. David Cohen, director of hepatology at Brigham and Women’s Hospital in Boston and guest speaker at the Mended Hearts Leadership Conference this July. “Whereas diet can contribute significantly to elevated cholesterol, the body’s natural metabolism can result in dangerously high levels of LDL cholesterol based solely on heredity factors. When working with a physician to manage your cardiovascular risk, it is important to understand that there are two sources of cholesterol and in many cases both need to be addressed.”

Because cholesterol is produced in all the body’s cells but is only broken down by the liver, it travels through the bloodstream (see sidebar, *Cholesterol — What Is It Good For?* on page 14). Because cholesterol and other fats cannot dissolve in the blood, they must travel to and from the cells via special carriers called lipoproteins. This gives rise to the famous siblings HDL and LDL (see sidebar, *What’s the Difference?* on page 13). Cholesterol is present in the digestive tract because it is a component of bile, which is produced in the liver. The liver breaks down cholesterol into bile salts, and also secretes cholesterol unmodified into bile. About half of biliary cholesterol is reabsorbed by the intestine and half is lost from the body. By contrast, 95 percent of bile salts are reabsorbed by the intestine and returned to the liver.

The fact that there are two sources of cholesterol also



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means that there are at least two ways of treating *hypercholesterolemia* — or too much cholesterol.

“Beyond lifestyle considerations, there are many effective treatment options available for control of high cholesterol,” said Dr. Cohen. “Patients with high cholesterol should make an extra effort to be as informed about their cholesterol levels as possible, and know about the sources of cholesterol. This will allow them to work with their doctor to create the best plan if treatment is required.”

Acknowledging that a cholesterol-lowering plan should include lifestyle steps to lower risk as well as drug therapies, members of the Adult Treatment Panel of NCEP echoed Mended Hearts’ and Dr. Cohen’s reminders about the importance of maintaining a heart-healthy lifestyle. “The idea that you can use cholesterol-lowering drugs without lifestyle changes is incorrect,” said Dr. Grundy. “Lifestyle changes have enormous benefits beyond lowering LDL cholesterol, such as raising good cholesterol, lowering triglycerides, improving diabetes and reducing inflammation.” ❤️



What’s the Difference?

Any discussion of cholesterol quickly uncovers the terms LDL and HDL. LDL cholesterol is the bad twin (think L for lousy), and HDL is the good twin (think H for healthy).

One of the main jobs of the liver is to make sure all the body’s tissues get the cholesterol and triglycerides they need to function. Whenever possible (i.e., for about 8 hours after a meal), the liver takes up dietary cholesterol and triglycerides from the bloodstream. During times when dietary lipids are not available, the liver produces cholesterol and triglycerides on its own.

Cholesterol is not water soluble, so it can’t travel through the bloodstream alone. To carry cholesterol and triglycerides to the cells where they are needed, the liver packages them, along with special proteins, into tiny spheres called “lipoproteins” that can travel in the bloodstream. The liver releases these lipoproteins into the circulation so they can be delivered to the body’s cells. The cells remove the cholesterol and triglycerides from the lipoproteins, to use them to build cell membranes.

What are LDL and HDL?

In the bloodstream, “bad” cholesterol is carried in low-density lipoprotein (LDL), and “good” cholesterol is carried in high-density lipoprotein (HDL). Most cholesterol in the blood is low-density (LDL). Only a small proportion is from HDL cholesterol.

Why are high cholesterol levels bad?

When LDL cholesterol levels are too high, the LDL tends to build up inside the lining of the blood vessels. These fatty buildups (atherosclerotic plaques) cause narrowing of the arteries and can rupture, causing blood clots to form that block blood flow and lead to heart attacks and strokes. Therefore, an elevated LDL cholesterol level is a major risk factor for heart disease and stroke.

Why is some cholesterol called “good cholesterol”?

A lot of evidence has now accumulated that increased HDL cholesterol levels are associated with a lower risk of heart disease, and that low HDL cholesterol levels are associated with an increased risk of heart disease. Thus, HDL cholesterol appears to be “good.”

Why is HDL cholesterol protective?

It appears that it’s not the cholesterol itself that is good, it’s the “vehicle.” There is some evidence that the HDL molecule “scours” the walls of blood vessels, cleaning out excess cholesterol. If this is the case, the cholesterol that HDL carries is actually “bad” cholesterol that’s just been removed from blood vessels, and is being transported back to the liver for further processing.

Note that both LDL and HDL carry chemically identical molecules of cholesterol; it is the fate of the cholesterol that differs between these two types of molecules. LDL, which is the largest component of serum cholesterol, stays in the bloodstream where it can slowly build up in the inner walls of the arteries that feed the heart and brain. HDL carries its cholesterol away from the arteries and back to the liver where it’s passed from the body.

What is High Risk?

Recommended treatment:
Strive for LDL below 100 mg/dL (milligrams per deciliter).

In the NCEP study, the high-risk category includes people who have

- A history of heart attack
- Unstable angina
- Coronary artery procedures, such as angioplasty or bypass surgery
- Peripheral artery disease
- Abdominal aortic aneurysm
- Carotid artery disease, transient ischemic attack or ischemic stroke
- Diabetes
- Two or more risk factors with a greater than 20 percent risk of heart attack or death in the next 10 years

What is Very High Risk?

Recommended treatment:
Strive for LDL below 70 mg/dL.

Patients are considered at very high risk if they already have cardiovascular disease plus

- Diabetes
- Persistent cigarette smoking
- Poorly controlled hypertension
- Multiple risk factors of the metabolic syndrome (high triglycerides, low levels of “good” HDL cholesterol, obesity)
- Immediately after a heart attack

For an online assessment of your risk, visit www.2cholesterolsources.com.

Cholesterol — What Is It Good For?

Cholesterol exists in every cell of all animal bodies, so it can't be all bad.

Cholesterol is kind of like a wax, and it is one of an important group of chemicals called lipids, which are primary components of membranes. The cholesterol content of any specific membrane, relative to other lipids, varies from tissue to tissue, and the amount of cholesterol it contains often determines the function of the membrane.

The ratio of cholesterol to other lipids determines such characteristics as the membrane's stability and its ability to allow other chemicals and proteins to move in and out. Membranes with high ratios of cholesterol to other lipids, such as the myelin membranes that make up the cells that cover the central nervous system, have high stability and a relatively limited capacity to let chemicals, nutrients and proteins in or out. Other membranes with lower cholesterol ratios are more fluid, allowing many chemicals, nutrients and proteins to pass through.

Cholesterol and Sex

In addition to its role in membrane structure and function, cholesterol has another extremely important function — it is one of the basic building blocks of the stress and sex hormones. Cholesterol is stored in the adrenal glands, testes and ovaries, where it is available to be converted to *steroid hormones*. Steroid hormones include the male and female *sex hormones* (androgens and estrogens) as well as the *adrenal corticoid hormones* (cortisol, corticosterone, aldosterone and other stress hormones).

Cholesterol and Digestion

Cholesterol is also found in the liver where it is used in the creation of bile acids. Bile acids are compounds manufactured by the body that are used in the digestive

process. When linked with the amino acids glycine or taurine, bile acids form bile salts. Bile acids are secreted into the intestine to aid in the digestion of food, especially other lipids or fats. Once the bile acid has done its job, it is reabsorbed by the intestinal tract, thereby reabsorbing the cholesterol in the bile. Preventing this reabsorption is an important strategy used to lower blood cholesterol levels.

Cholesterol Survey Findings

Here is a summary of the recent survey of people with high cholesterol:

- 45 percent of high-cholesterol patients said they were more concerned about cholesterol compared to other personal health issues and 75 percent felt that their cholesterol should be lower.
- When asked about the sources of cholesterol, more than three-quarters of respondents (77 percent) stated that the foods they eat contribute the most to high cholesterol. Among those who could name the two sources, more than half (57 percent) still mistakenly chose diet as the source that contributes most to cholesterol levels.
- 92 percent of respondents with high cholesterol who are not currently taking a high cholesterol prescription medication think their cholesterol should be lower than it is now.
- 75 percent of all respondents agree that their cholesterol should be lower than it is now.

About the Survey:

Mended Hearts, in conjunction with Merck/Schering-Plough Pharmaceuticals, sponsored the survey of 1,118 patients who reported having high cholesterol. This survey was composed of 566 respondents currently being treated with cholesterol-lowering medicines and 552 currently untreated.

For more information on the two sources of cholesterol visit www.2cholesterolsources.com. For more information on cholesterol in general, visit www.americanheart.org.

New Position to Help Raise Mended Hearts' Profile, Support

This spring, Mended Hearts created a new marketing and communications position both to extend its message reach and raise its organizational profile, particularly to target audiences.

In April, Tim Elsner was hired to lead the new outreach efforts. With 28 years of nonprofit communications management experience, Tim is new to Mended Hearts but not to heart-related nonprofit work.

For 15 years, Tim worked with the national office of the American Heart Association. While there, he held several senior communications positions including Director of Public Relations, Director of Corporate Communications and most recently Director of News Media Relations, where he managed the organization's health and science news dissemination program.

Prior to the AHA, Tim was with the American Cancer Society for 12 years — starting as a field representative in southeast Texas before eventually handling communications responsibilities for the entire state.

In this new position, Tim will manage internal and external communications responsibilities and market Mended Hearts to organizations and interests with similar objectives.

"The premise of my position is that we've reached a

point where we simply can't meet all of our ambitious patient support goals without continuing to enlist the support of others," he says. "I'm excited by Mended Hearts' past successes, the chal-

lenges of the future and the warm welcome I've received from the Mended Hearts volunteers, including a top-notch Resource Development and Public Relations Committee."

Former Mended Hearts president Donna DeLeese chairs the newly formed committee.

Tim also cites communications efforts at the local and national level as instrumental in helping the organization meet priority goals. "Public and healthcare community awareness of our efforts is critical to our success. To that end, I hope to be able to work with the committee to provide helpful resources and tools for both local volunteers and the national media," he says.

Tim encourages volunteers to contact him at any time for help, ideas or suggestions. He can be reached at 214-706-1406 or tim.elsner@heart.org. ❤️



Meet Our New Office Manager



Last November, Nikki Hardy joined the Mended Hearts staff as Office Manager at the national office. Nikki, a native of Elkhart, Indiana, relocated to Texas last June from Virginia Beach, Virginia. While in Virginia, Nikki was the Director of Operations at Samaritan House and Safe Harbor, a nonprofit organization that assists victims of domestic violence and the homeless community. Nikki is completing her Bachelors in Business Management, with only six more classes to go at Davenport University!

As Office Manager, Nikki manages the administrative staff team as well as financial matters, and acts as the staff liaison to the Conference Committee and hotel. She is also the staff liaison to the Finance Committee and is available to support the chapter treasurers on financial matters.

"The variety of responsibilities, coupled with the privilege of working with some great volunteers, really makes this position rewarding," says Nikki. "This is a great time of growth and development for Mended Hearts in its outreach to patients, and I'm excited to participate and contribute during this positive time."

If you have any chapter financial or membership questions, please feel free to contact Nikki at 214-706-1550 or nicole.hardy@heart.org. ❤️