

Watch Your Cholesterol

Why You Should Keep Your Blood Level in Check

You've heard that you should lower your cholesterol, but do you know why? Sometimes we tend to ignore advice when we don't understand the reasons. That's why it's important to learn what cholesterol is, what it does in your body and why you need to make sure too much isn't flowing in your blood.

Cholesterol is a waxy, fat-like substance that your body needs to function normally. It's used in the cell membranes that surround cells throughout your body. You also use cholesterol to make important chemicals, including hormones, vitamin D and the acids that help you digest fat.

"Cholesterol has a variety of uses in the body that are very important," says Dr. James Cleeman, coordinator of NIH's National Cholesterol Education Program, "but the body makes all it needs and we don't need to get any more from our food."

In fact, when the level of cholesterol in the blood gets too high, it can start to cause trouble. The landmark Framingham Heart Study, funded by NIH, first showed that the higher the cholesterol level in your blood,

the greater your risk for heart disease—the number 1 killer of Americans, both women and men.

What's the connection? Well, there are 2 forms of cholesterol in your blood: LDL and HDL. When there's too much cholesterol in your bloodstream, the cholesterol from LDL can build up in the walls of your **arteries**. Along with fats like **triglycerides** and other things in the bloodstream, it forms a growing "plaque" that bulges out of the artery wall and can begin to block blood flow—a process called **atherosclerosis**.

Problems get even worse if a plaque bursts and a blood clot forms on top, which can block an artery.

"Where LDL cholesterol does its most harm," Cleeman says, "is in the walls of the arteries going to the heart—the coronary arteries."

That's why a high LDL cholesterol level increases your risk for heart disease. Like any muscle, the heart's own muscle needs a constant supply of oxygen and nutrients, delivered by the blood in the coronary arteries. When these arteries become narrowed or clogged by plaque, the result is coronary heart disease. If the blood supply to a portion of the heart is completely cut off, the result is a heart attack.

HDL cholesterol seems to have the opposite effect of LDL; higher HDL



levels are associated with a lower risk for heart disease.

Some factors affecting your cholesterol level are out of your control. As you get older, for example, your cholesterol level naturally

continued on page 2

Definitions

Arteries

The tubes that carry blood from the heart throughout the body.

Atherosclerosis

The buildup of cholesterol and fat in the walls of arteries.

Triglycerides

A form of fat carried through the bloodstream. It also makes up most of the fat stored in fat tissue.

Inside News

- 1 Watch Your Cholesterol
- 3 The Cause of Achy Jaws?
- 4 Health Capsules

- Heart Attack Symptoms in Women
- Fit Seniors May Live Longer
- Web Site: Tips for Teens with Diabetes

continued from page 1

risers. Before menopause, women have lower total cholesterol levels than men of the same age, but after menopause women's LDL levels tend to rise. High blood cholesterol can also run in families. Your genes affect how fast you make cholesterol and remove it from the blood.

However, there are things you can control. "The clinical trial data are absolutely conclusive that lowering LDL



Wise Choices TLC to Lower Blood Cholesterol

Follow the 3 steps of the Therapeutic Lifestyle Changes (TLC) Program to lower your blood cholesterol and protect your health:

- **Diet.** Reduce the amount of saturated fat and cholesterol in your diet.
- **Weight.** If you're overweight, dropping pounds can help lower your levels of LDL cholesterol, total cholesterol and triglycerides.
- **Physical Activity.** Regular physical activity can help lower LDL (bad) cholesterol and raise HDL (good) cholesterol levels.

To learn more about TLC, explore the links on our web page (see upper right) or call 301-592-8573.

cholesterol reduces your risk for heart disease," Cleeman says. "This is true both for those with high cholesterol levels and for those with average cholesterol levels."

How do you know whether your cholesterol levels are where they should be? In general, the higher your risk for heart disease, the lower your LDL level should be. Cleeman says, "Your goal is individualized to your risk for a heart attack. The number depends on your own risk factors." NIH has a heart disease risk calculator online at <http://hp2010.nhlbihin.net/atpiiii/calculator.asp>, but you should also talk to your doctor about your risk factors and what your cholesterol levels should be.

"A person who has a cholesterol level higher than their goal LDL should follow the TLC program," Cleeman recommends. TLC stands for Therapeutic Lifestyle Changes. It involves 3 things: changing what you eat, doing more physical activity and controlling your weight.

First, diet. Saturated fat raises your LDL cholesterol level more than anything else in your diet. It's found mostly in meats and full-fat dairy products like whole milk, cheese and butter. Another type of fat called trans fat raises cholesterol similarly, but makes up far less of the American diet. Cholesterol in foods can also raise blood cholesterol levels, but its effect is not as strong as these fats'. Saturated fat, trans fat and chole-



Web Links

For links to more information about cholesterol and what you can do to lower your risk for heart disease, see this story online:

- http://newsinhealth.nih.gov/2008/January/docs/01features_01.htm

terol are all listed on food labels so that you can choose foods with lower amounts to help lower your LDL cholesterol level.

Foods with soluble fiber—such as whole grain cereals, fruits and beans—help lower your cholesterol, too. And some products, such as specially labeled margarines, orange juices and yogurts, contain the LDL-lowering compounds "stanols" and "sterols."

Excess weight can increase your LDL cholesterol level. "Fat tissue is not inert," Cleeman says. "It's chemically active and produces all kinds of changes." One is raising LDL blood cholesterol levels. Losing weight can help lower your LDL and total cholesterol levels, as well as raise your HDL and lower your triglycerides.

Regular physical activity can help you control your weight, lower your LDL and raise your HDL levels. You should try to be physically active for at least 30 minutes a day.

If these lifestyle changes don't lower your LDL cholesterol enough, medication can help. "Medication should be added to lifestyle changes," Cleeman advises, "not substituted for them." Lifestyle changes can bring benefits medications can't. While both can lower LDL, lifestyle improvements can lower blood pressure and other risk factors as well.

NIH's National Heart, Lung and Blood Institute recommends that everyone older than 20 have their blood cholesterol measured at least once every 5 years. Learn your numbers. Then talk to your doctor about whether you need to take steps to alter your diet, lose weight or get more physically active to lower your blood cholesterol and stay healthy. ■

NIH News in Health (ISSN 1556-3898) newsinhealth.nih.gov

Editor: Harrison Wein, Ph.D.

wein@od.nih.gov

Tel: 301-435-7489 Fax: 301-480-4026

Assistant Editor:

Vicki Contie

National Institutes of Health

Office of Communications

& Public Liaison

Building 31, Room 5B64

Bethesda, MD 20892-2094

Contributors: Vicki Contie, Margaret Georgiann (illustrations) and Harrison Wein

Get email updates when new issues are posted online. Go to <https://list.nih.gov/cgi-bin/wa?SUBED1=nihnewsinhealth-I&A=1> and follow the instructions or send an email to listserv@list.nih.gov with the words "Subscribe NIHNewsInHealth-L" in the message body.

Get print copies free of charge within the U.S. for display in offices, libraries or clinics. Please contact us for more information. You can also download copies for printing at our web site.

Reprint our articles. Material published in *NIH News in Health* is not copyrighted. We encourage you to reprint our articles and illustrations in print or web publications. Please acknowledge *NIH News in Health* as the source and send us copies of your publication.

The Cause of Achy Jaws?

It May Be a TMJ Disorder

You need it for talking, chewing, smiling, yawning, laughing and singing. It's the jaw joint—technically known as the temporomandibular joint (TMJ)—one of the hardest working and most complex joints in your body. You usually don't give it a second thought, and you usually don't need to. But if something goes wrong, your TMJ can cause nagging pain and limit the flexibility of your jaw. In extreme cases, the pain can be long-lasting and debilitating.

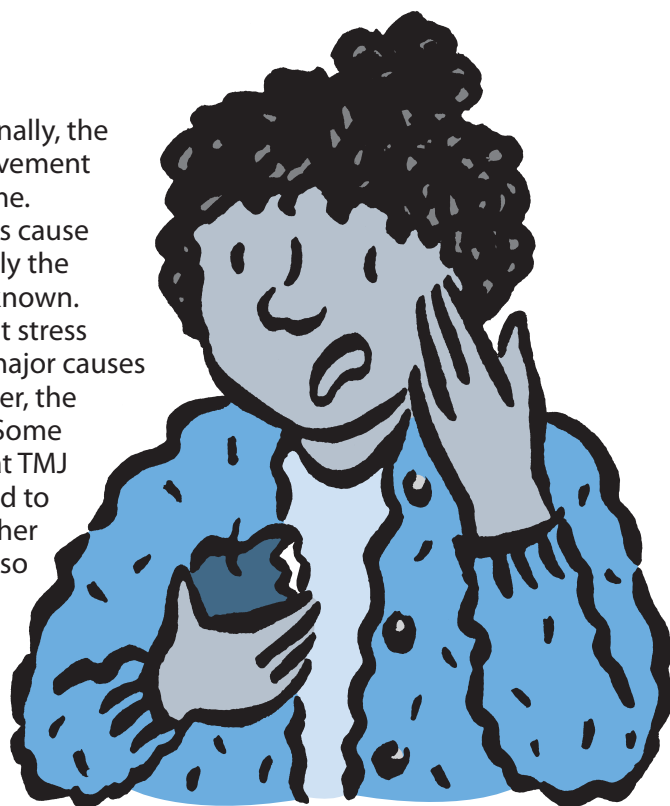
More than 10 million Americans have TMJ disorders, according to some estimates. They're usually first noticed as a pain in the chewing muscles or jaw joint. Other symptoms may include stiffness or locking of the jaw; painful clicking, popping or grating in the jaw joint; or a change in the way the upper and lower teeth fit together. The symptoms usually go away by

themselves. But occasionally, the pain and limited jaw movement may persist for a long time.

Jaw injuries sometimes cause TMJ disorders. But usually the underlying trigger is unknown. Many people believe that stress and tooth grinding are major causes of the condition. However, the research is still unclear. Some studies even suggest that TMJ disorders themselves lead to stress, rather than the other way around. Research also disputes the common belief that a bad bite or orthodontic braces can lead to TMJ disorders. And there's no scientific proof that clicking sounds in the jaw joint cause serious TMJ problems.

With so much uncertainty about the causes, there's also little certainty about treatment. The most widely used therapy is a plastic guard—sometimes called a stabilization splint or bite guard—that fits over the upper or lower teeth. But studies of its ability to relieve TMJ pain have been inconclusive.

To get some definitive answers about the cause of TMJ disorders, NIH is now funding the largest study of



its kind. Researchers are following more than 3,000 healthy adults for 3-5 years to see who will develop the disorders. This study will hopefully allow scientists to tease out the factors that can cause the TMJ to malfunction. Their preliminary findings suggest that **genes** can play a role. They found that people with certain genes are less sensitive to pain and much less likely to develop TMJ disorders.

As researchers learn more about what causes TMJ problems, they'll also find better ways to diagnose, treat and prevent the condition. But until that happens, experts recommend taking simple steps to relieve pain and avoiding procedures, like surgery, that can permanently change your bite or jaw. ■



Web Links

For links to more information about TMJ disorders, see this story online:

- http://newsinhealth.nih.gov/2008/January/docs/01features_02.htm



Wise Choices

Easing the Symptoms of TMJ Disorders

The most common jaw joint and muscle problems are temporary. Try these simple steps to relieve jaw discomfort. Talk with your doctor or dentist if the problems persist:

- Eat soft foods.
- Apply ice packs.
- Avoid extreme jaw movements, such as wide yawning and gum chewing.
- Learn techniques for relaxing and reducing stress.
- Practice gentle jaw stretches and relaxing exercises. Your health care provider or physical therapist may recommend specific exercises.
- Try over-the-counter pain medicines or nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen. Your dentist or doctor may prescribe stronger pain medications.



Definition

Genes

Stretches of DNA, a substance you inherit from your parents. Genes affect characteristics like height, eye color and how likely you are to develop certain diseases.

Health Capsules

Heart Attack Symptoms in Women

Chest pain or discomfort has long been seen as the most common early warning sign of a heart attack. But recent research has raised questions about whether this holds true for women. A new study looked at the available evidence and concluded that chest pain is the most common sign of heart attack for most women.

Heart disease is the leading cause of death among U.S. women. It affects 1 in 10 females over age 18. In light of the recent uncertainty about heart attack symptoms in women, NIH-funded researchers examined 69 studies published over 35 years. The studies ranged from large clinical trials to smaller studies and patient interviews.

Taken together, the studies showed that the majority of women—two-thirds to three-quarters—had chest discomfort with heart attack. In addition, the authors found that women seem to report a

wider range of symptoms than men. These include shortness of breath, nausea or vomiting, loss of appetite and dizziness.

Although chest pain may be the most common sign of heart attack for most women, experts recommend that any new symptoms be promptly evaluated. Surveys suggest that more women are now aware that heart disease is their leading killer, but many still don't take their risk of heart disease personally and seriously. ■



Web Links

For links to more information from NIH about heart disease and physical fitness, visit this Health Capsules page online:

- <http://newsinhealth.nih.gov/2008/January/docs/02capsules.htm>



Featured Web Site Tips for Teens with Diabetes

http://ndep.nih.gov/diabetes/youth/youthtips/youthtips_eat.htm

Teens with diabetes don't need to eat special foods. They just need to make healthy food choices. Learn how food affects your body and get tips for eating healthy and staying active with diabetes.

The screenshot shows a webpage with a navigation menu on the left, a main content area with text and a small image of a child, and a sidebar on the right with additional links and information. The main text includes questions like 'Why eat healthy foods?', 'How does food affect our bodies?', 'What should I eat?', 'What about sugar, sweets, and desserts? Am I allowed to eat them now?', 'How much should I eat?', and 'Put it all together. To learn more, check out...'. The sidebar contains a 'See our other Teen Tip Sheets' section with links to 'What is Diabetes?', 'Be Active', 'Stay At A Healthy Weight', 'Coping With The Top and Bottom of Diabetes', and 'Love Your Risk for Type 2 Diabetes'. There is also a 'Big reveal!' section at the bottom right.



Wise Choices Heart Attack Signs

Fast action can save lives. Everyone should know these warning signs of a heart attack:

- Pain or discomfort in the center of the chest that lasts for more than a few minutes, or goes away and comes back.
- Discomfort in other areas of the upper body. Can include one or both arms, the back, neck, jaw or stomach.
- Shortness of breath often comes along with chest discomfort, but it also can occur before chest discomfort.
- Other symptoms may include breaking out in a cold sweat, nausea or light-headedness.

Fit Seniors May Live Longer

Being physically fit after age 60 may extend your life, regardless of your body's fat content, according to a new study.

Scientists looked at more than 2,600 men and women, age 60 or older, who were involved in an NIH-funded study of exercise. The seniors walked on a treadmill to rate their fitness levels. Their fat levels were assessed by looking at their waist measurements, percent body fat and their weight to height ratio.

After a follow-up period that averaged 12 years, 450 participants had died. They were generally older than survivors and also had lower fitness levels. The percent of body fat did not appear to be related to the risk of dying. However, people

who were more fit, had a lower body mass index or smaller waist measurements were less likely to die during the study. The researchers also found that least-fit adults had a death rate 4 times higher than the fittest group.

The findings suggest that you don't need to be thin to benefit from regular physical activity. Regular activity—like brisk walking for at least 30 minutes most days of the week—will keep most older adults out of the lowest fitness category and possibly help prolong their lives. A key to healthy aging is being physically active, regardless of your weight.

To get a free copy of *Exercise: A Guide from the National Institute on Aging*, visit our web page for the link or call 1-800-222-2225. ■

