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Consider Your Liver

Here's How it Protects Your Health

Your liver is one of the most important organs inside your body, and it's also the largest. But do you know what it does or even where it's located? One thing's for sure: You can't live without it. Your liver carries out hundreds of essential tasks every day.

The liver is a reddish-brown wedge-shaped organ about the size of a football. It sits just under your ribs against the right side of your stomach. Most people's livers weigh about 3 pounds. But its size and weight can vary depending on your size.

"The liver is important for maintaining the health of the overall body, because it processes all the nutrients from the food that we eat. And it produces a lot of the proteins that the body needs to stay healthy," says Dr. Marc Ghany, a liver researcher and clinician at NIH. "It also cleanses the body of toxins and breaks down substances that could be harmful to the body. And it stores most of the vitamins and minerals that we need to stay healthy."

The liver clears away old red blood cells. It also makes substances that help your blood to clot.

The liver is tough and resilient.



Unlike most other organs, the liver can regenerate and repair itself after an injury. It keeps working even under stress. But over time, damage can build up and cause problems.

The good news is you can take steps to keep your liver healthy. And many liver diseases can now be treated or even cured, thanks in large part to NIH-supported discoveries.

Spotting Liver Problems • There are many kinds of liver diseases and conditions. Unfortunately, many disorders go undetected for years because they don't cause symptoms early on. About 4.5 million adults in the U.S. have been diagnosed with a liver disease. Many more may have one but don't yet know it.

Some liver diseases are caused by viruses. Others can result from drug or alcohol misuse. Some people have inherited disorders that affect the liver. Some have too much fat in their liver. When liver problems are chronic (long-lasting), they can lead to cirrhosis, or severe scarring of the liver. Cirrhosis is considered a

pre-cancerous condition. It can sometimes lead to liver cancer.

Warning signs of liver disease can include swelling of the abdomen and legs, changes in the color of urine or stool, or bruising easily. A yellowing of the skin or eyes, called jaundice, is another common sign of liver issues.

"But there may be no noticeable signs of disease until the liver has been severely damaged. And by then, it can be hard to treat,"

says Dr. Arun Sanyal, a physician and liver expert at Virginia Commonwealth University. "That's why it's really important, even if you're not having symptoms, to talk to your primary care doctor and ask about the health of your liver."

If problems are caught early, you can take steps to protect your liver's health (see the Wise Choices box).

Fat in the Liver • An increasingly common type of liver disease arises when too much fat builds up in the liver. This condition was known as nonalcoholic fatty liver disease. But experts changed the name in 2023 to "**metabolic** dysfunction-associated steatotic liver disease."

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Definitions

Metabolic

Having to do with metabolism, or the chemical changes in the body that create the energy and substances you need to grow, move, and stay healthy.

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Steatotic is a technical term for fat buildup in an organ. The new name highlights the links between fat in the liver and metabolic conditions, like diabetes and obesity.

“About 1 in 3 adults and maybe 1 in 5 adolescents in the United States has fatty liver, or steatotic liver disease,” says Dr. Norah Terrault, a physician and liver researcher at the University of Southern California. “This is a condition that can, in some instances, lead to scarring in the liver. It can even lead to cirrhosis and liver cancer.”

Having type 2 diabetes or obesity increases the risk for getting steatotic liver disease. Drinking too much alcohol can lead to a similar condition called alcohol-related liver disease. This condition also leads to fat buildup in the liver.

Definitions

Inflammation

Heat, swelling, and redness caused by the body's protective response to injury or infection.

Until recently, there were no approved medications to treat metabolic dysfunction-associated steatotic liver disease. But just last year, the U.S. Food and Drug Administration approved the first drug to treat a severe form of the disease. The drug is called resmetirom (brand name Rezdiffra). Other potential treatment strategies continue to be developed and tested.

When Hepatitis Happens •

The word “hepatitis” means **inflammation** or swelling of the liver. Most types of liver disease involve some sort of inflammation. Viruses, or viral hepatitis, is a leading cause of liver disease.

“Several different viruses can infect the liver. The main three that cause chronic liver infections are hepatitis B, hepatitis C, and hepatitis D,” Ghany says. These viruses usually spread through contact with an infected person's blood or other body fluids.

Another virus, called hepatitis A, can cause a brief, mild illness. It often spreads by drinking or eating contaminated foods. Effective treatments and prevention strategies are available for all these conditions.

“Fortunately, we now have a curative therapy for hepatitis C. There's an oral therapy that can cure more than 95% of people who are infected with the virus,” Ghany says.

Liver inflammation can also arise from exposure to toxic substances, too much alcohol, and certain drugs. For instance, the popular pain reliever acetaminophen, if taken improperly, can cause drug-induced liver injury. It's a major cause of acute liver failure in the U.S.

“Acetaminophen is generally safe to take,” Ghany explains. “But some people may inadvertently take too much because they haven't looked carefully at the product label.”

A combination of alcohol and

acetaminophen can be especially harmful to the liver.

Preventing Problems • Since many liver diseases have no symptoms until they are very advanced, it's important to get your liver checked at annual physical exams. Many problems can be detected by blood tests. “Be direct. Even if you have no symptoms, tell your doctor: I want my liver checked out,” Sanyal says. “It's important that you feel free to ask questions of your doctor.”

“If you have a liver disease, we have many good treatments for most of these conditions,” Terrault adds. “With treatment, you can reverse or at least stabilize your liver and not end up with serious complications like cirrhosis and liver cancer.” ■



Wise Choices

Look After Your Liver

- **Keep a healthy weight.**
- **Get moving.** Physical activity helps reduce the amount of fat stored in your liver.
- **Avoid alcohol.** For help finding alcohol treatment, visit alcoholtreatment.niaaa.nih.gov.
- **Don't smoke or quit if you do.** Get free help to quit smoking at smokefree.gov, 1-800-QUIT-NOW (1-800-784-8669), or by texting QUIT to 47848.
- **Don't share personal items that can spread viruses, like toothbrushes, razors, or needles.**
- **Get screened for liver diseases.** Ask your doctor what the results of your liver tests show about your liver's health.
- **See a health care provider if you have symptoms of liver problems, like jaundice or belly pain.**

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Web Links

For more about liver health, see “Find More Information” in the online article: newsinhealth.nih.gov/2025/04/consider-your-liver

Slowing Sarcopenia

Keep Your Muscles Healthy as You Age

Starting at age 30, our bodies naturally start to lose muscle mass. We lose about 3–5% every 10 years. You might not notice the effects at first. But over time, the reduced muscle mass leads to decreased strength. After a while, it can lead to a condition called sarcopenia.

“With aging, you start losing muscle mass, muscle strength, and have some limitations with your activities,” says Dr. Rosaly Corra-de-Araujo, an aging expert at NIH.

Some muscle loss is expected with the natural aging process. But too much muscle loss can lead to mobility difficulties. Sarcopenia can make it harder to stand up from a chair, walk, open a jar, or carry groceries. It can also increase your risk of falling.



Wise Choices

Build Your Muscle Strength

- **When beginning to exercise, start slowly.** Find a manageable exercise routine that you think you can do on a regular basis.
- **Work each major muscle group.** These include arms, legs, abs, back, and chest.
- **Focus on strength and resistance training.** Examples include push-ups, squats, sit-ups, arm curls, planks, side twists & bends, certain yoga poses, knee raises, and arm & leg lifts.
- **Do what you can.** Even five minutes of activity is better than none.
- **Eat enough protein.** Protein-rich foods include lean cuts of meat, poultry, and eggs; fish and seafood; low-fat or fat-free dairy; legumes, nuts, & seeds.
- **Talk with your doctor** before starting a new exercise routine to find the best options for you.

Certain factors may make muscle loss worse as you age. These include some chronic illnesses, a lack of exercise, and an unhealthy diet. Hormonal changes that occur during menopause can also contribute.

Researchers estimate that 10–20% of older adults have sarcopenia. But testing people for sarcopenia can be tricky. That’s because there isn’t a widely agreed-upon method to measure muscle loss. It’s also not clear exactly how much muscle someone can lose before it leads to disability or injury. So an NIH-funded team of experts recently set out to better define sarcopenia and its impact on people’s health.

The team analyzed data from several studies that looked at thousands of people aged 65 and older. They focused on three different measures of muscle health: grip strength, walking speed, and lean body mass. Those with weaker grip strength and slower walking speed (less than 2.6 feet per second) showed higher risk of falls, mobility limitations, hip fractures, and death. But lean body mass was not linked with these outcomes. As a result, the researchers recommended using grip strength and walking speed to help assess sarcopenia.

As muscle loss worsens, so can sarcopenia’s effects. Because sarcopenia increases your risk of falling, those who have it are nearly twice as likely to be hospitalized as those without it. Sarcopenia increases the risk of broken bones and the loss of independence with age. It can also make it more difficult for your body to fight certain diseases, like cancer.

You can take steps to prevent too much muscle loss and weakness as you age. Getting enough physical



activity is key. In particular, Corra-de-Araujo says, “you need to have resistance training because this is going to help build your strength.” Resistance training can include activities like push-ups, squats, or lifting weights. See the Wise Choices box for more tips on building muscle.

A healthy diet can also help prevent or manage sarcopenia. Your body needs protein to build and maintain muscle. Eating a diet rich in protein can keep your muscles healthy as you age. Experts suggest eating at least 1.2 grams of protein for every two pounds of body weight to treat or manage sarcopenia.

While more research is needed, some dietary supplements have shown promise for preventing muscle loss when combined with diet and exercise. These include amino acids, fish oil, vitamin D, selenium, magnesium, and omega-3 fatty acids.

If you think you might have sarcopenia, talk with your doctor. They can help you make a plan to prevent further muscle loss and preserve your health and independence. ■



For more about sarcopenia, see “Find More Information” in the online article: newsinhealth.nih.gov/2025/04/slowing-sarcopenia

Health Capsules

For links to more information, please visit our website and see these stories online.

Creating an Artificial Sense of Touch

Researchers are developing ways to create an artificial sense of touch in bionic limbs. They hope this will help people control and “feel” robotic arms and hands. Experts have already developed ways to help people sense the intensity and location of a touch. In a new study, scientists aimed to replicate more complex experiences, such as edges and motion.

The team tested their new system in two volunteers. Both volunteers had spinal cord injuries that harmed nerve communication between the

brain and hand. The researchers placed tiny electrodes into the participants’ brains. They targeted a region that manages complex touch information from the hand.

Researchers created specific electrical patterns in the brain. In response, participants reported different touch sensations. These included simple shapes and edges. Some activation patterns mimicked the sensation of using multiple fingers. This gave participants the feeling of complex touch sensations. They felt like they were grasping a

can or holding a pencil or a ball. One participant used the system to steer a wheel in response to the sensations of movement the implanted electrodes gave.

“This work went beyond anything that has been done before in the field of brain-computer interfaces,” says lead researcher Dr. Giacomo Valle from the University of Chicago and Chalmers University of Technology in Sweden, who led the study. More research is needed before such systems can be tested in larger studies. ■

What Is Anemia?

Anemia is the most common blood disorder in the U.S. It occurs when your body doesn’t have enough healthy red blood cells. Red blood cells are needed to carry oxygen from your lungs to the rest of your body. Anemia can leave you feeling tired, weak, dizzy, or short of breath. You may have headaches, pale skin, or cold hands and feet. But mild cases of anemia may not have symptoms.

Anemia is usually diagnosed via routine blood tests. Additional tests can help identify likely causes or complications of your condition.

There are several types of anemia. The most common is iron-deficiency anemia. It occurs when your body doesn’t have enough iron. Iron is needed to make red blood cells. This type of anemia can arise if you don’t eat enough iron-rich foods or if you’ve had blood loss, such as from menstruation, pregnancy, or certain digestive disorders.

Another type of anemia is caused by a lack of vitamin B12. It’s sometimes called pernicious anemia.

A condition called hemolytic anemia occurs when red blood cells

break down faster than they can be replaced. This type of anemia can be caused by infections, some medicines, or inherited conditions like sickle cell disease.

To treat anemia, your doctor may recommend taking iron supplements, vitamins, or medicines that help your body make red blood cells. To prevent anemia in the future, you may be advised to eat a diet rich in iron or certain vitamins. Learn more about anemia at go.nih.gov/NIHNIHApr25Anemia. ■

Featured Website

I’m So Stressed Out!
go.nih.gov/NIHNIHApr25Stress

Life can be stressful. If you are struggling to cope, or the symptoms of your stress or anxiety won’t go away, it could affect your health. Learn to recognize what

causes or triggers your stress. Uncover ways to tell the difference between stress and anxiety. Get tips for coping and find ways to get help if you’re struggling.

I’m So Stressed Out! Fact Sheet

Is it stress or anxiety?
Stress vs. Anxiety
It’s important to manage your stress.
Coping With Stress and Anxiety
Recognize when you need more help
More Resources
Reports

View the related infographic to share this information on social media.

Feeling overwhelmed? Read this fact sheet to learn whether it’s stress or anxiety, and what you can do to cope.


Is it stress or anxiety?

Life can be stressful—you may feel stressed about performance at school, traumatic events (such as a pandemic, a natural disaster, or an act of violence), or a life change. Everyone feels stress from time to time.

What is stress? Stress is the physical or mental response to an external cause, such as having a lot of homework or having an illness. A stressor may be a one-time or short-term occurrence, or it can happen repeatedly over a long time.

What is anxiety? Anxiety is your body’s reaction to stress and can occur even if there is no current threat. If that anxiety doesn’t go away and begins to interfere with your life, it could affect your health. You could experience problems with sleeping, or with your immune, digestive, cardiovascular, and reproductive

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