



American Heart Association®
Reduce Your Risk™

MY LDL CHOLESTEROL GUIDE



Understanding and Managing **LDL (Bad) Cholesterol**

heart.org/LDL

Understanding & Managing **LDL CHOLESTEROL**



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Understanding LDL Cholesterol



Understanding and improving LDL cholesterol is important for everyone, particularly heart attack and stroke survivors. High LDL cholesterol contributes to a higher risk for heart disease, such as heart attack and stroke.

What Are Cholesterol and Triglycerides?

Cholesterol is a waxy, fat-like substance your body produces naturally. It is in the bloodstream and in your body's cells. Your body makes all the cholesterol it needs and uses it to keep you healthy. It helps make new cells, some hormones, and substances that help digest foods.

Cholesterol is part of a healthy body. But having too much of it in your blood can be a problem. In addition to what your body makes, the foods you eat can impact your cholesterol numbers as well. Two types of lipoproteins carry cholesterol to and from cells.

Low-density lipoprotein (LDL) cholesterol is often called the “bad” kind. When you have too much LDL cholesterol in your blood, it can join with fats and other substances to build up in the inner walls of your arteries, creating a thick, hard substance called **plaque**. The arteries can become clogged and narrow, and blood flow is reduced. If the buildup of plaque ruptures, a blood clot may form at this location or a piece may break off and travel in the bloodstream, causing a heart attack or stroke. The most recent guidelines from the American Heart Association and the American College of Cardiology recommend that “lower is better” to reduce your risk. Studies show that for healthy adults an LDL at or below 100 mg/dL is ideal for good health. If you have a history of heart attack or stroke and are already on a cholesterol-lowering medication, your doctor may aim for your LDL to be 70 mg/dL or lower.

The “good” kind of cholesterol is **high-density lipoprotein (HDL)**. It removes the “bad” LDL cholesterol away from the arteries and back to the liver, so it can be removed from your body. HDL may also remove cholesterol from plaque in the arteries.

Triglycerides are the most common type of fat in your body. They come from food, and your body also makes them. They also can build up within your artery walls and cause plaque.



Cholesterol can join with fats and other substances in your blood to build up in the inner walls of your arteries. The arteries can become clogged and narrow, and blood flow is reduced.

What Do My Cholesterol Numbers Mean?

Ask your health care professional to order a blood test to measure your cholesterol numbers, typically called a “fasting” or “non-fasting lipid profile or panel.” It assesses several types of fat in the blood. It is measured in milligrams per deciliter (mg/dL). The test gives you four results: total cholesterol, LDL (bad) cholesterol, HDL (good) cholesterol and triglycerides (blood fats).

It’s important to know your cholesterol numbers; work with your health care professional to treat your overall risk of heart attack and stroke.



LDL Cholesterol: Myths Vs. Facts



Myth: You don’t need your LDL (bad) cholesterol checked until you’ve reached middle age.

Fact: The American Heart Association (AHA) recommends all adults 20 and older have their LDL cholesterol checked every four to six years as long as risk remains low. If you have heart disease (including prior heart attack or stroke), talk to your health care professional about the right frequency of testing.

Myth: Only overweight and obese people have high LDL cholesterol.

Fact: People of any body type can have high LDL cholesterol. Being overweight or obese increases your chances of having high LDL cholesterol but being thin doesn’t protect you. Regardless of your weight, diet, and amount of physical activity, you should have your LDL cholesterol checked regularly.

Myth: Having high LDL cholesterol is only a man’s problem.

Fact: Both men and women tend to see higher LDL cholesterol numbers as they get older. Although atherosclerosis typically occurs later in women than in men, cardiovascular disease remains the leading cause of death in women. Health care professionals should consider women specific conditions, such as premature menopause (less than age 40) and pregnancy associated conditions, when discussing their LDL cholesterol numbers and potential treatment options.

Myth: If your health care professional hasn't mentioned your LDL (bad) cholesterol number, you're OK.

Fact: You need to take charge of your health. If you are 20 or older, ask your health care professional to conduct a cholesterol test, assess your risk factors and determine your risk for heart attack or stroke. If you're between 20 and 39, your health care professional should assess your lifetime risk. If you're between 40 and 75, ask your health care professional to assess your 10-year risk. If your risks are high, lifestyle changes and statin medication may help manage your risk. If you've had a heart attack or stroke, it is especially important to regularly check your LDL cholesterol number and take any cholesterol-lowering medications as prescribed. Check in with your health care professional if you have any questions on your treatment plan.

Myth: Your LDL (bad) cholesterol number is a result of your diet and physical activity.

Fact: True, diet and physical activity affect your LDL cholesterol, but they are not the only factors. Getting older and being overweight or obese also may cause your LDL cholesterol numbers to rise. Some people are born with high LDL cholesterol that they've inherited from their parents. Regardless, it's important to know your number, as too much LDL cholesterol can increase your risk for heart attack or stroke.

Myth: Taking cholesterol-lowering medicines means you don't have to make diet and lifestyle changes.

Fact: It's important to take your medicines exactly as they're prescribed. But making diet and lifestyle changes may also help to reduce your risk for heart attack and stroke.



Understanding Risk



Your health care professional may have told you that you are at higher risk of having a heart attack or stroke. You may be feeling a bit overwhelmed by this, but with the right treatment plan and the support of your health care professional, you can live a healthy lifestyle and lower your risk of heart attack or stroke.

Why Am I at Risk?

Assessing Your Risk

Your health care professional will want to know whether you are at risk by 1) reviewing your medical and family history, and 2) gauging your overall risk for heart attack or stroke. They will want to know:

- **Whether you've ever had a heart attack or stroke**, or blockages in the arteries of your heart, neck or legs.
- **Your risk factors.** Your health care professional will consider your age, sex, whether you have diabetes, high blood pressure, high LDL cholesterol, and if you smoke or vape.
- **About your lifestyle.** Your health care professional will ask about your diet and physical activity numbers, alcohol intake and any drugs or supplements you've been taking.

Your health care professional may use a risk calculator to determine your overall risk for heart attack or stroke. This calculator uses your cholesterol numbers in addition to the other risk factors to estimate your risk. For example, a 10-year CVD (cardiovascular disease) risk estimate of 10% means of 100 patients with the same risk factors as you, 10 would be expected to have a heart attack or stroke in the next 10 years.



- **If you're between 40 and 75, and have no history of heart attack or stroke**, ask your health care professional to assess your 10-year risk.
- **If you're between 20 and 39, and have no history of heart attack or stroke**, your health care professional may assess your lifetime risk. If your risk is high or you have a family history of early cardiovascular disease (CVD) in your family, or if you have an LDL of 160 mg/dL or more, your health care professional may recommend cholesterol-lowering medication and heart-healthy lifestyle changes.
- **If you have a history of heart attack or stroke and are already on a cholesterol-lowering medication**, your health care professional may aim for your LDL to be 70 mg/dL or lower. Working closely with your health care professional can significantly reduce your risk of recurrence. Ask your health care professional to assess your risk level and help you choose the right cholesterol-lowering medication or combination of medications for you. Always make sure to take your medications as prescribed and attend all your follow-up appointments.

What is a Coronary Artery Calcium (CAC) test?

If the decision to start statin medication to lower your LDL cholesterol numbers is still unclear, your health care professional may request another test called a CAC test to measure the amount of calcium in your blood vessels. If the CAC result is zero and you don't smoke or have any other factors that could increase your risk such as diabetes or a family history of early heart attack or stroke, then you may be able to wait to start statins for now.

How Will My Risk Factors Be Treated?

Whether your health care professional prescribes medications or not, they will want you to make some lifestyle changes. These include following a heart-healthy diet, increasing physical activity, losing weight and not smoking. No matter what treatment plan you and your health care professional decide upon, it's very important that you stick to it. A treatment plan can't work the way it's supposed to if it isn't followed, but you can do it!

What Else Might Increase My Risk of Heart Attack and Stroke?

There are several other things that can help you and your health care professional decide whether LDL cholesterol-lowering medications are right for you. These are called "risk enhancing factors".

Check each of the boxes below that apply to you:

- ☐ Do you have a family history of early heart attack or stroke (younger than 55 years old for men and younger than 65 years old for women)?
- ☐ If you have had a previous heart attack or stroke and on a cholesterol-lowering medication, is your LDL cholesterol number 70 mg/dL or below?
- ☐ Is your LDL cholesterol (LDL-C) number between 160-189 mg/dL? Is your non-HDL cholesterol number between 190-219 mg/dL?
- ☐ Has a health care professional told you that you have metabolic syndrome?
- ☐ Do you have chronic kidney disease?
- ☐ Do you have any chronic inflammatory conditions, such as psoriasis, rheumatoid arthritis, or HIV/AIDS?
- ☐ If you're a woman, did you have menopause early (before age 40)? Did you ever have preeclampsia during a pregnancy?
- ☐ Are you Hispanic/Latino, African American, or South Asian?
- ☐ Have you ever had blood test results with high numbers of the following? Were the numbers still high after the test was repeated? Please note that you may not have had these tests done before, so you may not have a number.
 - ☐ Triglycerides (≥ 175 mg/dL)
 - ☐ High-sensitivity C-reactive protein (≥ 2.0 mg/L)
 - ☐ Lipoprotein A (Lp(a) ≥ 50 mg/dL)
 - ☐ Apolipoprotein B (apoB ≥ 130 mg/dL)
 - ☐ Ankle-brachial index (ABI) < 0.9

Does my race/ethnicity impact my risk?

Race/ethnicity can influence your 10-year risk calculation, how intense your treatment may need to be, or even the medications that might be best for you. Some examples include:

- People who are South Asian have higher risk of atherosclerotic cardiovascular disease (ASCVD) than some other groups.
- People who are East Asian may be more sensitive to statins.
- People who are non-Hispanic black or African American are more likely to have high blood pressure.
- People who are Native American/Alaskan natives tend to have higher rates of certain risk factors.

Talk to your health care professional if you think your race/ethnicity may be an important factor in your risk or treatment of a heart attack or stroke.



Genetics and Cardiovascular Risk

Familial hypercholesterolemia (FH) is a condition that runs in the family where people have very high LDL cholesterol numbers in their blood – above 190 milligrams per deciliter (mg/dL). Men and women are affected equally.

Everyone's LDL cholesterol numbers tend to rise with age, but people with FH are born with high LDL cholesterol. As time passes, it gets worse. FH can't be treated by diet and exercise alone. These lifestyle changes may help lower LDL, but when numbers must be decreased by 50% or 75%, medication is needed.

Talk to your health care professional if you have a family history of heart attack or stroke or very high LDL cholesterol numbers at an early age.



How to Talk to Your Health Care Professional About Your LDL Cholesterol Numbers and Your Risk for Heart Attack and Stroke

If you have high LDL cholesterol, understanding your risk is one of the most important things you can do. Studies show that for healthy adults an LDL at or below 100 mg/dL is ideal for good health. If you have a history of heart attack or stroke and are already on a cholesterol-lowering medication, your doctor may aim for your LDL to be 70 mg/dL or lower.

High numbers of LDL cholesterol at any point throughout your lifetime can have a cumulative effect in significantly increasing your risk for heart attack and stroke and stroke. So, it's important, even at a young age, to maintain healthy cholesterol numbers.

But the good news is, by working together, you and your health care professional can choose the best treatment plan for your specific needs.



Questions for Your Doctor

- What does my LDL cholesterol number mean?

- What does high cholesterol do to my body?

- How do I know if LDL cholesterol has caused plaque in my arteries?

- Do I have an LDL cholesterol goal?

- How long will it take to lower my LDL with lifestyle changes versus medication treatment? Are there risks in delaying medication?

- How often should I have my LDL cholesterol number checked?

- Do you think my LDL cholesterol number is due to my lifestyle or to hereditary, or a combination of both?

- Are diet and exercise enough to lower my LDL cholesterol number?

- What cholesterol-lowering medication will you prescribe? Are there any side effects I should be aware of?

- How will I know if my medication is working and how long will that take?

- When would you like to see me next?

- When should my next LDL test be?

Cholesterol Medications



If you and your doctor decide together that you need to take medication to reduce your high LDL (bad) cholesterol number, it's because you're at risk for heart attack or stroke. Usually, the treatment plan combines healthy lifestyle changes including diet and physical activity, and medication.

What type of medicine may I be prescribed?

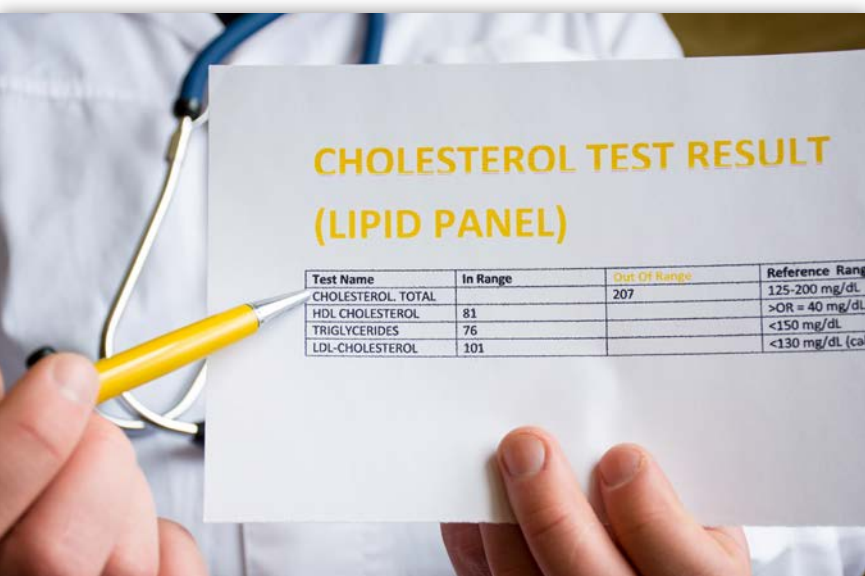
Various medications can lower LDL cholesterol numbers. By working together, you and your doctor can decide the best treatment plan for you.



- **Statins, also known as HMG-CoA reductase inhibitors**, prevent the production of cholesterol in the liver, which effectively lowers LDL cholesterol numbers. Statins are usually the first medication doctors recommend.
- **Ezetimibe, also known as cholesterol absorption inhibitors**, prevent cholesterol from being absorbed in the intestine. They are the most commonly used non-statin medications to lower LDL cholesterol.
- **PCSK9 inhibitors, also known as proprotein convertase subtilisin/kexin type 9 inhibitors**, are LDL-lowering medications that help the liver remove more LDL cholesterol from the blood. There are two forms: Monoclonal Antibodies and Small Interfering RNA (siRNA).
 - The monoclonal antibodies lower LDL cholesterol by binding to a protein made in the liver and may also have effects outside the liver. Some names include alirocumab and evolocumab.
 - The siRNA works differently and lowers LDL numbers by stopping the liver from producing PCSK9. The available siRNA is called inclisiran.
- **ACLY inhibitors, also known as adenosine triphosphate-citrate lyase inhibitors**, work in the liver to block the production of cholesterol. They are used in combination with lifestyle changes and statins to further decrease LDL cholesterol numbers in adults with hereditary high cholesterol and people with heart disease who need to further lower their LDL numbers. Some names are bempedoic acid, and bempedoic acid and ezetimibe.
- **Bile acid sequestrants** cause the intestine to get rid of more cholesterol. Some common names are cholestyramine, cholestipol and colestevlam.

The following are triglyceride-lowering medications and have mild LDL-lowering action, but data does not support their use as an add-on to statins.

- **Fibrates** are especially good for lowering triglyceride (blood fat) numbers and have a mild LDL-lowering action. Some names are gemfibrozil, clofibrate and fenofibrate.
- **Niacin (nicotinic acid)** is a vitamin B that limits the production of blood fats in the liver. Take this only if your doctor has prescribed it. It can help lower triglycerides, increase HDL, and may mildly lower LDL.



Your doctor will monitor your progress with statin medications and recommended lifestyle changes. Doctors typically first prescribe statins and if a statin alone doesn't lower your LDL cholesterol enough, your doctor may recommend other medications.

Your doctor will help decide which medication or combination is best for you. Follow instructions carefully, and tell your doctor about any side effects or if it's not working. **Don't stop taking your medications without talking to your doctor.**



How do I know if my medication is working?

Knowing if your medication is working or not may be unnoticeable. It is important that your doctor tests your blood cholesterol numbers regularly. Together with your doctor, set a goal and ask how long it may take to reach that goal and keep your LDL cholesterol number low.

How to Talk with My Doctor About Cholesterol-Lowering Medications

By working together, you and your doctor can decide the best treatment plan for your specific needs. While a healthy lifestyle may help, sometimes medications are needed to reduce LDL cholesterol numbers and prevent heart attacks and strokes.

When medication is needed, statins continue to provide the most effective LDL cholesterol-lowering treatment in most cases. If you have problems taking a statin or if a statin alone doesn't lower your LDL cholesterol number enough, there are some other drug options. For example, If you have a very high LDL cholesterol number or have had already a heart attack or stroke, your doctor might suggest adding other LDL-lowering drugs to your statin medication.



These Questions Can Help You Start the Conversation:

- ♥ *Do you think I'm at risk for heart attack and stroke?*
- ♥ *Do I have any other factors that can increase my risk?*
- ♥ *Do you think statins or other medications are right for me? What are some of the pros and cons about taking statins?*
- ♥ *How long will I need to take these medicines?*
- ♥ *How will we know if they are working?*
- ♥ *Will the medications be enough to lower my risk? Do I need to make other changes as well?*
- ♥ *Are there any side effects I should look for when taking this medication?*
- ♥ *Are there any medicines, foods, or dietary supplements I should avoid taking with this medication?*
- ♥ *Where can I learn more about this medicine?*

My Treatment Plan



My Treatment Plan

Work with your health care professional on an agreed upon plan that works best for you and your family. For support, encourage your whole family to join you in your heart-healthy lifestyle. This includes:

- Making sure you understand what LDL cholesterol is and how to manage it.
- Knowing your risk for heart attack and stroke and how to reduce it.
- Not smoking.
- Eating a heart-healthy diet.
- Getting enough physical activity.
- Reaching and maintaining a healthy weight.

Talk to your health care professional about your blood pressure and blood sugar to make sure they are in check or managed properly too.



Take your medications safely.

- Follow your health care professional's instructions.
- Never stop taking your medications unless your doctor instructs you to.
- If you find yourself missing or not using your meds, talk to your health care professional.
- Take your medications at the same time each day.
- Read the labels on your medication bottles carefully.
- Use a pill calendar or reminder app.

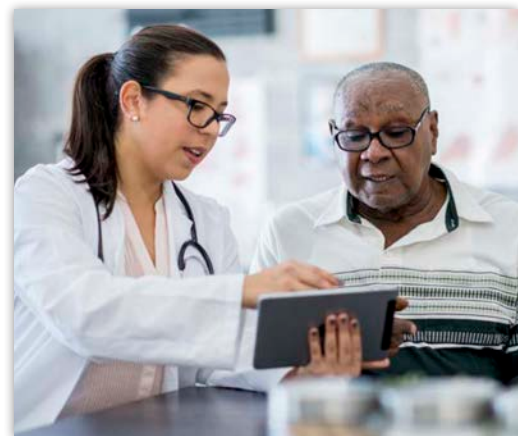


Working With Your Health Care Professional

Your health care professional is there to help you reach your health goals, including keeping your LDL cholesterol at a healthy number. Work closely with your health care professional to make the best decisions for you, and then stick to the plan. Making decisions together is the best way to create a treatment plan you'll be more likely to stick to.

Take part in making decisions about your health together and asking the right questions. If you don't understand something, ask for further clarification.

Here's a helpful checklist that you and your health care professional should go through to determine your risk and the best treatment options for you.



☐ Assess Your Risk

If you're between 20 and 39 and have never had a heart attack or stroke, your health care professional may assess your lifetime risk. If your risk is high or if you have a family history of an early heart attack or stroke and have an LDL of 160 mg/dL or more, your clinician may recommend statin medications and lifestyle changes to lower your risk.

If you're between 40 and 75, and have never had a heart attack or stroke, ask your health care professional to assess your 10-year risk of having a heart attack or stroke.

If you have a history of heart attack or stroke and are already on a cholesterol-lowering medication, your health care professional may aim for your LDL to be 70 mg/dL or lower. Working closely with your health care professional can significantly reduce your risk of recurrence. Ask your health care professional to assess your risk level and help you choose the right cholesterol-lowering medication or combination of medications for you. Always make sure to take your medications as prescribed and attend all your follow-up appointments.

My risk score is:

*Discuss your risk score and risk enhancing factors (see **page 7**) and how they affect your risk. Ask if additional tests may be needed.*

☐ Discuss lifestyle changes (e.g., diet, physical activity, weight or body mass index, and not smoking) you can work on.

Goals I need to work toward:

- ☐ Physical Activity: _____
- ☐ Weight Loss: _____
- ☐ Diet: _____
- ☐ Quit Smoking: _____
- ☐ Other: _____

If you need help making these changes, ask your health care professional for information or materials to assist you.

☐ **Statins may be right for you if:**

- Your 10-year risk is high
- You've had a heart attack, stroke, or blood clots
- You have very high LDL cholesterol numbers
- You have diabetes

Statin prescribed:

Name and dose of medication

☐ **Discuss potential side effects.**

Side effects may include:

☐ **Discuss the combination of statin and non-statin therapy if you're at high risk.**

Additional medication prescribed:

Side effects may include:

☐ **Are the cost of medicines going to be a concern?** ☐ Yes ☐ No

Discuss potential out-of-pocket cost and medication assistance programs that may be available.

☐ **Set follow up appointment** to determine how effective lifestyle changes and medications have been at lowering your LDL cholesterol.

My follow-up appointment is:



Take the time to ask questions about the things you and your health care professional have discussed. **If you don't understand something, ask for further clarification.**

How Can I Improve My LDL Cholesterol?

Eating a heart-healthy diet may help you improve your cholesterol and reach and maintain a healthy weight and blood pressure.

The following tips can help you get started.



What should I eat?

Focus on eating foods low in saturated and trans fats such as:

- A variety of fruits and vegetables.
- A variety of whole-grain foods like whole grain bread, cereal, pasta and brown rice. At least half of the servings should be whole grains.
- Fat-free, 1% and low-fat milk products.
- Poultry without skin and lean meats.
- When you choose to eat red meat and pork, select options labeled “loin” and “round. These cuts usually have the least amount of fat.
- Fatty fish such as salmon, trout, albacore tuna and sardines.
- Enjoy at least 8 ounces of non-fried fish each week, which may be divided over two servings.
- Unsalted nuts, seeds, and legumes (dried beans or peas).
- Nontropical vegetable oils like canola, corn, olive or safflower oils.



What should I limit?

- Foods with a lot of sodium (salt).
- Sweets and sugar-sweetened beverages.
- Red meats and fatty meats that aren’t trimmed.
- Full-fat dairy products such as whole milk, cream, ice cream, butter, and cheese.
- Baked goods made with saturated and trans fats like donuts, cakes and cookies.
- Foods that list the words “hydrogenated oils” in the ingredients panel.
- Tropical oils such as coconut, palm and palm kernel oils.
- Solid fats like shortening, stick margarine and lard.
- Fried foods.

What Other Steps Can I Take Toward Better Health?

Catching Your Zzzz's

Sleep issues, especially not sleeping enough, sleep apnea and insomnia can increase the risk of obesity, high blood pressure, Type 2 diabetes, stroke, coronary heart disease and overall CVD.

Use these tips to get a better night's sleep:

- Add some stress-relieving exercise to each day.
- Plug in your phone and other electronic devices away from your bed.
- Try to go to bed and wake up at the same time each day.



Meditation

Studies have offered promising results about the impact of meditation on cardiovascular risk reduction.

Practicing mindfulness and meditation may help you:

- Manage stress.
- Manage high blood pressure.
- Sleep better.
- Feel more balanced and connected.
- Reduce your risk of heart disease.



Making Self-Care a Priority

Self-care is crucial for monitoring and managing your medical conditions as well as preventing a heart attack or stroke. Self-care includes living a healthy lifestyle, adhering to a drug regimen and paying attention to new or worsening symptoms. It's important to work with your health care professional to ensure you are properly diagnosed and monitored.

Being a champion of your own care is vital.



Resources



American Heart Association

What Does My LDL Cholesterol Number Mean?

Why Should I Know My LDL Cholesterol?

LDL Cholesterol Questions for My Doctor

Cholesterol-Lowering Medications

LDL Cholesterol: Myths vs. Facts

Learn more at heart.org/LDL.

The Lower Your LDL Cholesterol Now
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