



A free guide

Your LDL

What it raises, how it adds up, and what lowers it



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Please read

General education, not individual medical advice. Reading or using this guide does not create a doctor–patient relationship. Check with your doctor before starting any new exercise, supplement or treatment. Try anything in this guide only if it is safe for you, and stop if something feels wrong. In an emergency, call 911.

What high LDL raises your risk of

LDL is the main cholesterol-carrying particle that gets trapped in artery walls and builds plaque. A major European consensus review of over 200 studies, covering more than 2 million people, concluded that LDL *causes* this kind of artery disease. It isn't just a marker.

Where the evidence is strongest

Trials and genetic studies agree. "Genetic studies" compare people born with naturally higher or lower LDL.

Condition	What the evidence shows
Heart attack and coronary heart disease	In statin trials, every 40 mg/dL lower LDL cut heart attacks and coronary deaths by about a fifth, relative, over about 5 years. Genetic studies, not trials, suggest people born with LDL about 40 lower have about half the heart disease, from a lifetime of it, not a late start. Starting later still helps: in trials, by about a fifth.
Stroke from a blocked artery	Higher LDL raises it modestly, most clearly for strokes from narrowed large arteries. In trials, lowering LDL cut strokes overall by about a sixth per 40 mg/dL, relative, through fewer clot strokes. See the note on bleeding strokes below.

What high LDL raises your risk of *(continued)*

Less certain, but worth knowing

Mostly from genetic studies, without trials.

Condition	What the evidence shows	How strong the link is
Leg artery disease	Narrowed arteries in the legs. More ApoB (a count of LDL and similar particles) raises it, though less than for the heart. In 1 large trial, a newer LDL-lowering drug also cut serious leg-artery problems.	Stronger
Aortic aneurysm	A bulging main artery in the belly. People with genetically higher LDL had higher odds of one, relative. A link seen in groups, not a forecast for you.	Moderate
Aortic valve narrowing	Genetically higher LDL went with about 1.5 times the odds per 40 mg/dL, relative. But once the valve is narrowed, lowering LDL hasn't slowed the valve's narrowing in trials. That's about the valve, not heart attacks.	Mixed

What high LDL raises your risk of *(continued)*

Good to know: a major 2024 expert report lists high LDL in midlife as a dementia risk factor that may be changeable. That's based on large population and genetic studies, which show a link, not proof. Trials haven't yet shown that lowering LDL prevents dementia. A risk factor isn't a forecast: it doesn't mean you will get dementia. In trials, very low LDL hasn't harmed memory or thinking.

Cholesterol-lowering drugs come with one small trade-off. In people who already had heart or blood-vessel disease, trials found a small rise in bleeding strokes. The clot strokes prevented clearly outnumbered them. In people without it, bleeding strokes didn't rise. If you've had a bleeding stroke, ask your doctor how this applies to you. If you're on a statin or working on your LDL, keep going.

Sources: Ference et al., *Eur Heart J* 2017 (EAS consensus) · CTT, *Lancet* 2005 · Ference et al., *JACC* 2012 · Hindy et al., *Stroke* 2018 · Levin et al., *Circulation* 2021 · Bonaca et al., *Circulation* 2018 (FOURIER) · Harrison et al., *JAMA Cardiol* 2018 · Nazarzadeh et al., *Eur Heart J* 2020 · SEAS, *NEJM* 2008 · Livingston et al., *Lancet* 2024 (dementia commission) · Giugliano et al., *NEJM* 2017 (EBBINGHAUS) · Judge et al., *J Stroke Cerebrovasc Dis* 2019.

Lifetime exposure: the area under the curve

Plaque builds with **how high** your LDL is and **for how long**. One way to picture it: multiply your LDL by the years you've had it. The result is your exposure in "mg-years", the area under your LDL curve. One lab result can't give you your own number, because LDL changes over a lifetime.

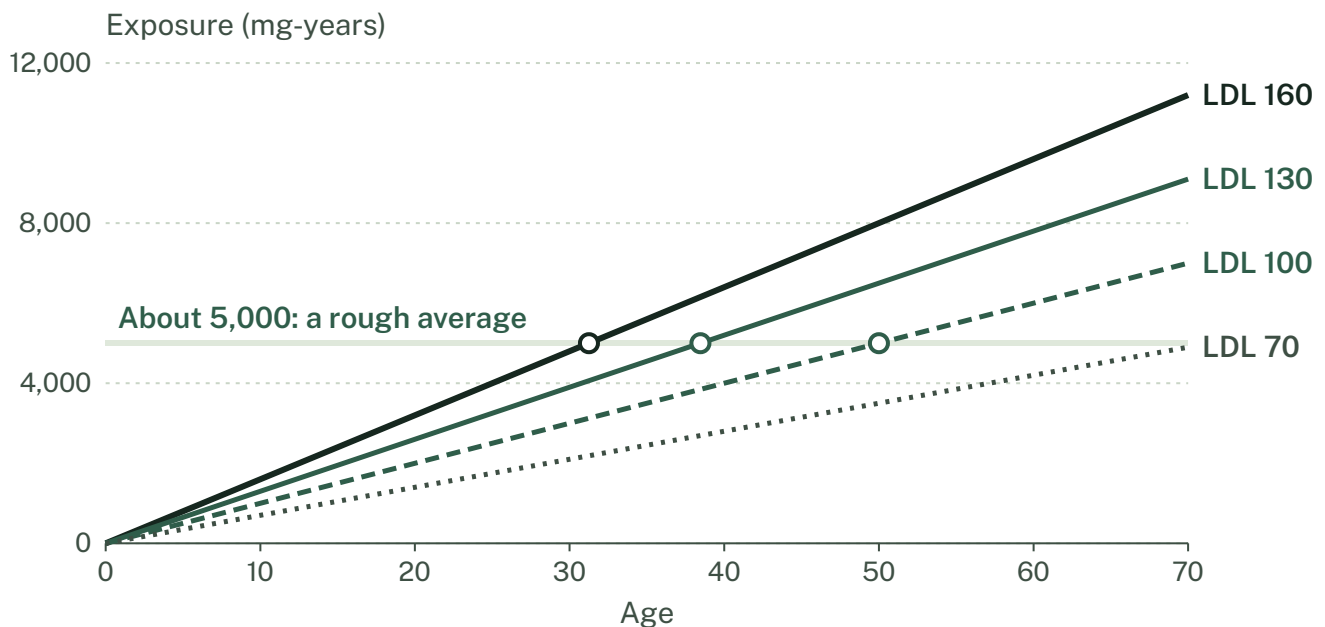
A 2018 review worked through an example. At an average untreated LDL of 125, people reach about **5,000 mg-years** by age 40. That's around where heart-attack risk becomes measurable, about 1 in 100. It's a rough average, not your personal threshold. Below it isn't zero risk, and above it isn't damage done. Risk keeps climbing with each added year, and a lower LDL makes it climb more slowly.

Lifetime exposure: the area under the curve

(continued)

Exposure builds with age

LDL × age, as if the level had held since birth. Circles mark where each line passes 5,000: about age 31 at an LDL of 160, 38 at 130 and 50 at 100. An LDL of 70 comes close but stays under 5,000 through age 70.



Your risk also depends on blood pressure, smoking, diabetes, family history and Lp(a). These numbers also run a little high, because LDL is lower in childhood. The point is the comparison, so don't plug in one lab value to get your own number. Which number is yours is a conversation with your doctor.

Lifetime exposure: the area under the curve

(continued)

Earlier lowering avoids more exposure

Picture someone at 160 who brings LDL down to 100. The shaded area is the exposure they still build; the outlined gap is what they avoid by 70.



By 70, the same LDL drop made 20 years earlier avoids 3 times the exposure. That likely means more benefit, though not exactly 3 times as much. Lowering at 60 still avoids some. This compares amounts of exposure, not your risk.

Sources: Ference et al., JACC 2018 (the 5,000 mg-year estimate; age $\times$ LDL method) · Nordestgaard et al., Eur Heart J 2013 (EAS, cumulative burden) · arithmetic ours.

What the numbers mean for you

Relative risk says how much a risk changes. **Absolute risk** says how many people out of 100 it happens to. “1.5 times the risk” means 4 in 100 becomes 6 in 100, or 20 in 100 becomes 30 in 100. To know how much a change matters, you need both numbers.

What exposure looks like in real people:

- **Young adulthood counts.** In 36,030 people, an LDL of 100 or higher from ages 18 to 39 went with about 1.6 times the heart disease later in life, relative, even after accounting for LDL from age 40 on. That’s a comparison between groups, not a 64% chance.
- **Plaque shows up early.** In US adults whose LDL averaged under 70 from age 20 to 35, about 8 in 100 had coronary calcium (a sign of plaque) by about age 45. Of those at 160 or higher, about 44 in 100 did. These are group rates, not your odds.
- **Timing may matter, not just the total.** In another study of young adults followed into midlife, people who built up the same exposure at a younger age seemed to have higher risk than those who built it up later. This compares groups. It doesn’t set a deadline.

Non-HDL is total cholesterol minus HDL, and it tracks closely with LDL. If your report lists non-HDL, compare that number with the 30-year figures below, not your LDL.

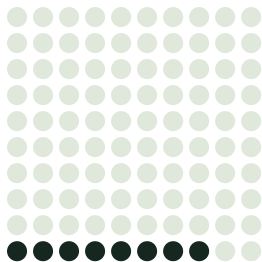
What the numbers mean for you *(continued)*

Out of 100 people, over 30 years

In about 400,000 adults without heart disease, about 34 in 100 women with the highest non-HDL cholesterol (220 or more) were estimated to have a coronary event or clot stroke over 30 years, versus 8 in 100 with the lowest (under 100). In men, 44 versus 13. These are group estimates, not a forecast for you.

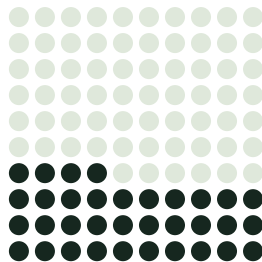
Women

Lowest non-HDL



8 in 100

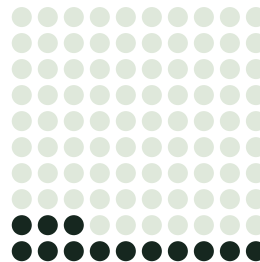
Highest non-HDL



34 in 100

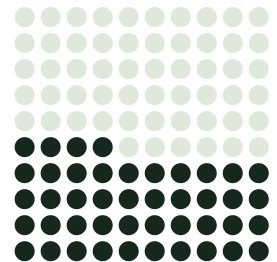
Men

Lowest non-HDL



13 in 100

Highest non-HDL



44 in 100

● estimated event over 30 years, before accounting for age

Some of that gap reflects age and other risks; after accounting for them, risk was about twice as high, relative, and a bit more than that in men.

What the numbers mean for you *(continued)*

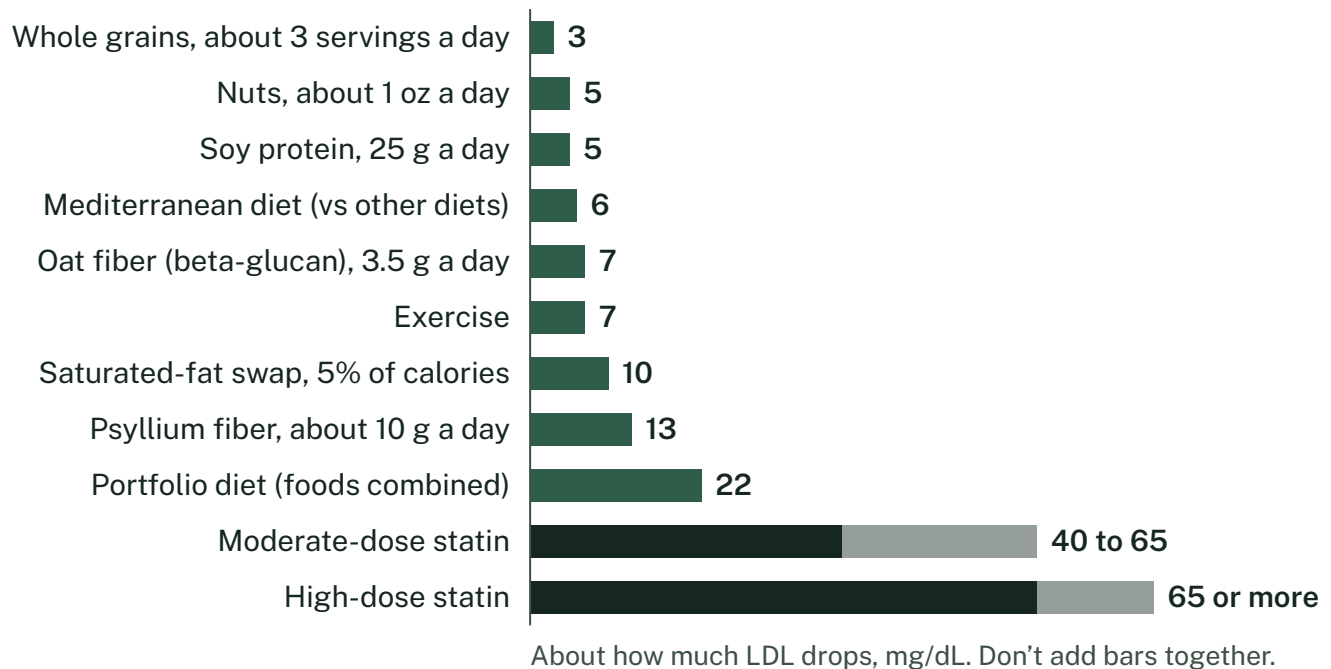
What lowering it earns. In statin trials, every 40 mg/dL lower cut heart attacks, strokes, stents and bypasses by about a fifth over about 5 years, relative. For people whose 5-year risk was under 10%, each 40 mg/dL lower meant about 11 fewer of these events per 1,000 people over 5 years. Your doctor can estimate your own risk. Genetic studies, not trials, suggest a whole lifetime of LDL about 40 lower goes with about half the heart disease. Trials, which ran about 5 years, showed about a fifth less. Starting later still lowers risk; starting earlier may lower it more. Which number is yours is a conversation with your doctor.

Sources: Zhang et al., JACC 2019 · Pletcher et al., Ann Intern Med 2010 (CARDIA) · Domanski et al., JACC 2020 (CARDIA) · Brunner et al., Lancet 2019 · CTT, Lancet 2010 and 2012 · Ference et al., JACC 2012 and Eur Heart J 2017.

What lowers LDL, and by how much

Each change on its own

For someone starting at an LDL of 130. These are averages from trials; your change will differ. Don't add rows together: only the portfolio diet stands for several foods combined.



This ranks what moves your cholesterol numbers. It's not a ranking of what protects your heart. Exercise, sleep and not smoking protect it in ways a cholesterol panel doesn't show.

What lowers LDL, and by how much *(continued)*

Strength training may lower LDL about 6; the trials disagree. Popular, but no LDL drop in trials: apple cider vinegar, red wine, and fish oil, which lowers triglycerides instead. Over-the-counter fish oil hasn't been shown to prevent heart attacks.

Watch for: keto and low-carb diets lower triglycerides and usually raise LDL a bit, about 5 to 8 mg/dL on average; in some lean people, a lot more. Unfiltered coffee (French press, boiled) can raise LDL; paper-filtered barely does. Your own response can differ. Recheck your numbers.

Table sources: psyllium, Jovanovski et al. 2018 · oats, Ho et al. 2016 · portfolio diet, Chiavaroli et al. 2018 · fat swap, Mensink (WHO) 2016 · exercise, Sports Med 2025 meta-analysis · Mediterranean, Cochrane 2019 · nuts, Del Gobbo et al. 2015 · soy, Blanco Mejia et al. 2019 · whole grains, Eur Heart J 2026 · statins, 2026 ACC/AHA guideline. Drops for statins and the portfolio diet are estimated from their average % at a starting LDL of 130.

Medicines, and where food fits

On average, by how much each lowers LDL:

- **Statins:** moderate dose 30 to 49%, high dose 50% or more.
- **Ezetimibe, added to a statin:** roughly another 20 to 25%, less on a high-dose statin.
- **Injectable PCSK9-pathway drugs, added to a statin:** about another 50 to 60%.
- **Bempedoic acid, for people who can't take a statin:** about 20%.

Our suggestion: if you're on a statin or working on your LDL, keep going. It doesn't need to be statin or lifestyle. Food adds to a statin. It doesn't replace one when you need one.

Important. An LDL of 190 or higher (LDL, not total cholesterol) is treated without a risk calculator under the 2026 US guideline. Talk to your doctor soon, not at your next physical.

Which LDL number is right for you depends on your own risk. That's a conversation with your doctor.

Sources: 2026 ACC/AHA cholesterol guideline · IMPROVE-IT, NEJM 2015 · FOURIER, NEJM 2017 · ORION-10/11, NEJM 2020 · CLEAR Outcomes, NEJM 2023.

My log

Write the date and your LDL each time it's checked, and what you'd changed since the last test.

Date	LDL (mg/dL)	What I changed