MERCOLA
Take Control of Your Health

Cholesterol Does Not Cause Heart Disease

Analysis by Dr. Joseph Mercola Fact Checked | September 28, 2023

STORY AT-A-GLANCE

- Cholesterol, long vilified as the cause of cardiovascular disease, is a vital component to nearly every cell in your body for the construction of cell membranes, regulation of cell signaling and neurological health
- A review of three large industry-funded studies found it was impossible for cholesterol to be the main cause of heart disease as those with low levels had the same levels of arterial sclerosis as those with high levels
- The same study found benefits claimed by statin supporters are ineffective and unsafe, as statements are invalid, compromised by misleading statistics and excluding information from unsuccessful trials
- Heart disease is driven by a chronic inflammatory response in your body you may impact through adequate intake of magnesium, reducing insulin secretion, balancing omega-3 and omega-6 fat ratio and maintaining iron levels in safe limits

Editor's Note: This article is a reprint. It was originally published October 10, 2018.

Cholesterol is a waxy substance found in nearly every cell of your body, vital for optimal functioning. For instance, your body uses cholesterol in the construction of cell membranes and in regulating protein pathways required for cell signaling. Without sufficient amounts of cholesterol in your body you may experience a negative impact on your brain health, hormone levels and heart disease risk.

Your body also uses cholesterol to manufacture vitamin D after exposure to the sun. Most of the cholesterol in your body is manufactured in your liver using nutrients extracted from your food. Animals use cholesterol in much the same way, which means meat from beef, pork or chicken have similar levels.[1]

The rate your body absorbs dietary cholesterol ranges between 20 and 60%, depending on individual factors.[2] Unfortunately, while critical to your health, saturated fats and cholesterol have been wrongly vilified as the culprits of heart disease for more than six decades.

The first scientific evidence linking trans fats to heart disease and exonerating saturated fats was published in 1957 by the late biochemist Fred Kummerow.[3] Unfortunately, his research was overshadowed by Ancel Keys' Seven Countries Study,[4] which linked saturated fat to heart disease.

Later, reanalysis of Keys' study revealed the data was cherry picked to produce this link, but by then the saturated fat myth was already firmly entrenched. In the past several decades, other studies have debunked the saturated fat myth.

Most recently, a scientific review[5] identified significant flaws in three industry-funded studies, and presented substantial evidence that total cholesterol and low-density lipoprotein (LDL) cholesterol levels are not an indication of heart disease risk.

Yet Another Study Busts the Cholesterol Myth

Guidelines published for eating fats continue to be confusing as the basic premise was wrong. Dietary fat is associated with heart disease, but it is processed vegetable oils loaded with trans fats and damaged omega-6 fats that are producing the problem, not saturated fats.

An international team of 17 experts analyzed the results from three large reviews published by statin advocates. The three studies attempted to validate the current belief that statin treatment helps prevent cardiovascular disease. The international team was

unable to satisfy criteria for causality and found fault in the conclusions the three studies made.[6]

The international team wrote there may be an association between young and middle-aged people with high total or LDL cholesterol that may potentially raise the risk of heart disease.

However, they point out an association is not the same as causation, and few previous studies have adjusted for other factors linked to heart disease such as coagulation, inflammation, infections and endothelial sensitivity. Specifically, the authors found:[7]

- There was no association between total cholesterol and the degree of atherosclerosis severity.
- Total cholesterol levels are generally not predictive of the risk of heart disease and may be absent or inverse in many studies.
- In many studies LDL was not associated with atherosclerosis and in a large U.S. based study of nearly 140,000 patients who suffered an acute myocardial infarction, LDL levels at the time of admission were lower than normal.
- Adults over the age of 60 with higher LDL levels generally live longer.
- Few adults who experience familial hypercholesterolemia die prematurely.

The researchers concluded that high cholesterol levels cannot be the main cause of heart disease as those with low levels have nearly the same degree of sclerosis as those with high levels, and the risk of having a heart attack is the same or higher when cholesterol levels are low.

They believe the hypothesis has been kept alive by reviewers using misleading statistics and excluding results from unsuccessful trials while ignoring numerous contradictory observations.[8]

Statins Raise Risks Without Benefits

In dire cases, physicians may prescribe a medication with significant side effects when the potential benefits outweigh the possible risks, such as a strong antibiotic known to potentially trigger kidney damage when you suffer a life-threatening infection. In this instance, although there is significant risk with the antibiotic, without it you will likely die.

However, as statin drugs are designed to reduce cholesterol levels and cholesterol does not cause heart disease, all risks associated with the medication come without any benefit to your health. The trend for prescribing statin drugs is concerning, and is particularly relevant to diabetics whose underlying disease increases their risk of heart disease.

Recommendations suggest high dose statins should be automatically started in anyone 40 to 75 years of age with diabetes but no other risk factors for heart disease.[9] This, despite the fact that statins have been shown to increase fasting blood glucose levels in diabetics.[10] While statin supporters claim the drug is safe and effective, research has uncovered multiple side effects, some of which are deadly:[11,12]

- **General —** Urinary tract infections, dizziness, partial loss of sensitivity to sensory stimuli, distortion of the sense of taste, amnesia and headache
- **Gastrointestinal —** Diarrhea, indigestion, nausea, intestinal gas, constipation, abdominal discomfort, abdominal pain, vomiting and pancreatitis
- **Metabolic —** Abnormal liver function tests, hyperglycemia, hepatitis, anorexia, hypoglycemia and weight gain
- **Musculoskeletal —** Joint pain, pain in extremity, musculoskeletal pain, muscle spasms, myalgia, joint swelling, back pain, elevated creatine phosphokinase, neck pain and muscle fatigue, muscle wasting and amyotrophic lateral sclerosis (ALS)[13]
- **Cardiovascular —** Death in up to 10% of patients,[14] contributes to heart disease[15]

Strikingly, the expert reviewers in the featured study noted claims of effective and safe treatment with statin drugs are invalid, saying:[16]

> *"In our analysis of three major reviews, that claim the cholesterol hypothesis is indisputable and that statin treatment is an effective and safe way to lower the risk of CVD [cardiovascular disease], we have found that their statements are invalid, compromised by misleading statistics, by exclusion of unsuccessful trials, by minimizing the side effects of cholesterol lowering, and by ignoring contradictory observations from independent investigators."*

Inflammation Drives Cardiovascular Disease

Biased research launched a low-fat myth and reshaped the food industry for decades to come. As saturated fat and cholesterol were rejected, manufacturers switched to using trans fats and sugar to add taste to processed foods. These changes increased inflammatory levels and drove a new level of disease.

A study from Brigham and Women's Hospital was the culmination of a nearly 25-year cardiovascular research work designed to test if reducing inflammation would also reduce the risk of recurrent heart attack or stroke. The study enrolled 10,000 people with a history of heart attack and a persistently elevated C-reactive protein level, a strong biomarker of inflammation.

At the conclusion of the study, the researchers noted that using medication to reduce inflammation also reduced the risk of cardiovascular disease, lung cancer and death.[17] However, the medications used in the study came with significant side effects. In contrast to acute inflammation after an injury, chronic inflammation does not produce immediate symptoms.

Over an extended period of time, chronic inflammation silently damages your tissues and arterial walls, which your body attempts to repair. These repairs may build over time and create plaque, potentially breaking off and blocking smaller arteries in the heart or brain, triggering a heart attack or stroke.

This process may go on for years without being noticed, as chronic inflammation has few apparent symptoms. Research has demonstrated deficiencies and excesses of

certain micronutrients, such as folate, vitamin E and zinc, may result in an ineffective or excessive inflammatory response. Researchers note:[18]

> *"Inflammation acts as both a 'friend and foe': it is an essential component of immunosurveillance and host defense, yet a chronic low-grade inflammatory state is a pathological feature of a wide range of chronic conditions, such as the metabolic syndrome, nonalcoholic fatty liver disease, Type 2 diabetes mellitus and CVD."*

Assessment of Heart Disease Risk More Effective Using These

Specific ratios and blood level values tell you more about your risk of heart disease than your total cholesterol number. The size of your LDL cholesterol and your LDL particle number, for example, is more important than your overall total LDL value.

Large particle LDLs are not harmful to your health while small, dense LDL particles may create injury as they squeeze through the lining of your arteries, oxidize and trigger inflammation.

An NMR LipoProfile, which measures your LDL particle number, is a better assessment of your risk of heart disease than total or total LDL cholesterol level. The following tests may also give you a better assessment of your potential risk for cardiovascular disease:

- **High sensitivity C-reactive protein (HS-CRP) —** This is one of the best overall measures of inflammation and an excellent screen for your risk of heart disease. Ideally your level should be below 0.7 and the lower the better.
- **Cholesterol ratios —** Your HDL/cholesterol ratio and triglyceride/HDL ratio are both strong indicators of your risk. For your HDL/cholesterol ratio divide your HDL by your total cholesterol and multiply by 100. The percentage should ideally be above 24%. For your triglyceride/HDL ratio divide your triglyceride total by your HDL. The ideal percentage is below 2%.

- **Fasting insulin level —** As sugar and carbohydrates are metabolized they trigger a release of insulin, which creates triglycerides and promotes the accumulation of fat. This process increases inflammation and makes it more difficult to lose or maintain an ideal weight. Excess fat around your midsection is one of the major contributors to heart disease.[19]

  Your fasting insulin level can be determined by a simple, inexpensive blood test. A normal fasting blood insulin level is below 5 microunits per milliliter (mcU/ml) but, ideally, you'll want it below 3 mcU/ml. If your insulin level is higher than 3 to 5, the most effective way to optimize it is to reduce net carbs.

- **Fasting blood sugar level —** Studies have demonstrated people with higher fasting blood sugar levels have a higher risk of having coronary heart disease.[20] When your fasting blood sugar is between 100 and 125 mg/dl, your risk of coronary artery disease increases by 300% compared to having a level below 79 mg/dl.

- **Iron level —** Iron creates an environment for oxidative stress, so excess iron may increase your inflammation and increase your risk of heart disease. An ideal iron level for adult men and nonmenstruating women is between 40 and 60 nanograms per milliliter (ng/ml). You do not want to be below 20 ng/ml or above 80 ng/ml.

Manage Your Heart Disease Risk With Effective Choices

To effectively manage your cardiovascular risk, it is critical to reduce chronic inflammation. Magnesium plays a vital role in biological function and mitochondrial health, and is a culprit in the development of inflammation when your levels are low. It may also play a role in inhibiting the deposit of lipids on arterial walls and plaque formation.[21]

In one double-blind, placebo-controlled trial, patients who received intravenous magnesium within 24 hours of their heart attack experienced 24% fewer deaths within the following five years.[22] Researchers concluded the benefits of magnesium intake on chronic disease may be explained by the effect it has on inhibiting inflammation.

There are multiple factors affecting the inflammatory process in your body. Some of the more significant over which you have control, include:

- **Hyperinsulinemia —** An excess of insulin in your blood triggered by a diet high in net carbohydrates. What you eat tends to be the deal-breaker in how much insulin your body secretes. However, there are other factors contributing to your insulin levels, such as smoking, sleep quality, exercise and vitamin D level.

- **Unbalanced fatty acids —** Your body needs a balance of omega-3 and omega-6 fats. Unfortunately, most diets have an overabundance of omega-6 fats leading to greater levels of inflammation. Strive for a 1-to-1 ratio of omega-3 to omega-6 fats to reduce inflammation and your risk of heart disease.

- **High iron stores —** Ensure your ferritin blood levels are below 80 ng/ml. If elevated, the simplest and most efficient way to lower your iron level is to donate blood. If you can't donate, then therapeutic phlebotomy will effectively eliminate the excess iron.

- **Leaky gut —** Food particles and bacteria leaking from your intestines increase your level of inflammation and your risk of heart disease. By eliminating grains, sugars and lectin-rich legumes, while adding fermented foods, you may heal your gut and reduce your level of inflammation.

- **Inadequate levels of magnesium —** A century ago your diet provided nearly 500 milligrams (mg) of magnesium per day. Today, courtesy of nutrient-depleted soil, you may be getting only 150 mg per day. Your body flushes excess magnesium through your stool, so using magnesium citrate and monitoring stool consistency, consider starting with 200 mg of oral magnesium citrate and gradually increasing until you develop slightly loose stools.

My personal preference for magnesium supplementation is magnesium threonate, as it appears to more efficiently penetrate cell membranes, including your mitochondria. It penetrates your blood-brain barrier and may help improve memory. It also may be a good alternative to reduce migraine headaches.

Sources and References

- [1] Berkeley Wellness, September 1, 2011
- [2] Eating Well, How much does eating cholesterol in my food really affect my blood cholesterol?
- [3] Washington Post June 16, 2015
- [4] The Seven Countries Study, Ancel Keys
- [5, 6, 7, 8, 16] Expert Review of Clinical Pharmacology, September 10, 2018, doi: 10.1080/17512433.2018.1519391
- [9] American College of Cardiology, May 22, 2017
- [10] Journal of Investigative Medicine, 2009;57(3)
- [11, 14] Drugs.com, Atorvastatin
- [12] WebMD, Simvastatin Side Effects by Likelihood, 2018
- [13] Drug Safety, 2007;30(6):515
- [15] Expert Reviews of Clinical Pharmacology 2015;8(2):189
- [17] Forbes, August 27, 2017
- [18] British Journal of Nutrition, 2015;114(7)
- [19] Critical Pathways in Cardiology, 2007;6(2):51
- [20] The American Journal of Cardiology, 2002;89(5):596
- [21] Dr. Sircus, July 17, 2015
- [22] European Journal of Clinical Nutrition, 2014;68: 510