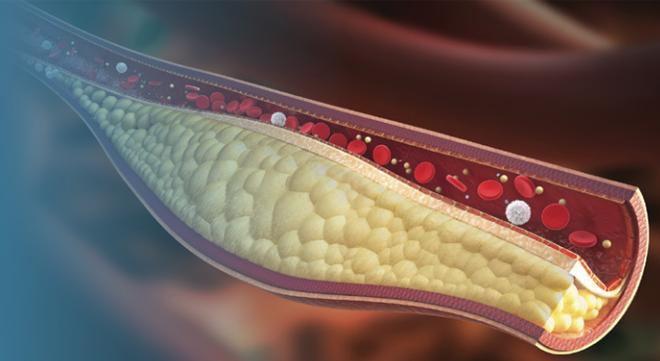


# Cholesterol and Heart Disease

PhysiciansCommittee  
for Responsible Medicine



Nearly 2,400 Americans die of cardiovascular disease daily, with an average of one death occurring every 37 seconds. In 2018, roughly one out of every 10 Americans over the age of 20 had some type of cardiovascular disease (coronary heart disease, heart failure, and/or stroke), and one out of every seven deaths in the United States was due to coronary heart disease alone.<sup>1</sup> Heart disease is the leading cause of death in the United States, affecting Black Americans the most. Eating habits, lack of access to health care, food insecurity, and other lifestyle factors play a large role in determining the risk of heart disease and may prevent or even reverse this condition.

## Atherosclerosis

### *What Is Atherosclerosis?*

Atherosclerosis is a common form of heart disease, in which plaques of cholesterol and other substances form in the artery walls and eventually restrict blood flow. This constricted circulation leads to less oxygen for the heart muscle, resulting in chest pain (angina), usually following exercise or excitement. When a plaque ruptures, it can trigger the formation of a clot, stopping blood flow. This is a heart attack, or myocardial infarction.

Atherosclerosis is not caused by old age. Examination of American casualties during the Korean and Vietnam wars showed significant atherosclerosis by age 18 or 20.<sup>2</sup> Older adults are more likely to have heart conditions not because of genetics, but because they may have had unhealthy habits, like smoking and poor nutrition, for longer periods of time. Only about 5% of the population has a genetic tendency toward heart disease. Many studies show the connection between lifestyle choices and heart health.

In 1948, William Castelli, MD, began to monitor people living in Framingham, Mass., to study what factors influenced the rate of heart disease.<sup>3</sup> The Framingham Heart Study showed that participants with total cholesterol levels of less than 150 milligrams per deciliter (mg/dL) had dramatically reduced risk of coronary artery disease. In the first 50 years of the study, only five subjects with cholesterol levels of less than 150 mg/dL developed coronary artery disease. The study and many others have made it clear that maintaining a low cholesterol level has a major protective effect.

## Cholesterol

### *What Is Cholesterol?*

Cholesterol is a waxy substance but is not the same as fat. The liver

produces cholesterol and sends it to other parts of the body to make hormones and cell membranes. The liver makes all the cholesterol we need. When we eat animal products, the saturated (“bad”) fat and cholesterol they contain cause our cholesterol levels to rise. Unfortunately, many Americans have total cholesterol levels of more than 200 mg/dL putting them at risk. The U.S. Dietary Guidelines for Americans recommend limiting cholesterol intake as much as possible.

### *Different Types of Cholesterol*

When cholesterol is transported in the bloodstream, it is carried in various particles called lipoproteins. Low-density lipoprotein (LDL) is also called “bad cholesterol” because, at high levels, it can dramatically increase the risk of a heart attack. Once cholesterol is released in the blood, it is then picked up for disposal by high-density lipoproteins (HDL), the “good cholesterol.” Having enough HDL cholesterol and keeping both total cholesterol and LDL cholesterol within normal limits is best for heart health.

## How to Lower Your Total and LDL Cholesterol

### *Decrease Cholesterol Intake*

Since our bodies make more than enough cholesterol for our needs, we do not need to eat foods that have it. Cholesterol is found in all foods that come from animals: red meat, poultry, fish, chicken, eggs, milk, cheese, yogurt, and other dairy products. Many people are surprised to learn that chicken often contains as much cholesterol as beef, 25 milligrams per ounce.<sup>4</sup> A 4-ounce serving of beef or chicken contains about 80-120 milligrams of cholesterol. Most shellfish such as shrimp are even higher in cholesterol. It is recommended to avoid animal products to help lower cholesterol.

Cholesterol in your daily diet adds to your cholesterol level, although the effect varies from person to person. The good news is cholesterol levels can be reduced dramatically by changing the foods you eat. For every 1% you reduce your cholesterol level, you reduce your risk of heart disease by 2%.<sup>5</sup> For example, a reduction from 300 mg/dL to 200 mg/dL (i.e., a one-third reduction) will yield a two-thirds reduction in the risk of a heart attack.

### *Decrease Fat Intake, Especially Saturated Fats*

Reducing your fat intake is an important step to lower cholesterol and reduce the risk of other chronic diseases. Animal products, including meat and many dairy products, as well as fried food and vegetable oils, are high in fat. When reading a food label,



*Go Vegan*

A diet based solely on plant foods—whole grains, legumes, vegetables, and fruits—is the best way to lower the risk for heart disease. Plant-based foods do not contain cholesterol, are typically low in saturated fat, and are the only foods that contain fiber, making them especially heart-healthy.

Two large cohort studies and one meta-analysis found that vegetarians had a much lower risk of dying from heart disease than nonvegetarians.<sup>7</sup> A study in the *Journal of Nutrition* found that a single high-fat meal can put more work on the heart and raise blood pressure.<sup>8</sup>

In addition to the very low levels of fat in a vegetarian or vegan diet, plant-based foods help decrease the risk for heart disease. A cohort study in 2020 showed that replacing red and processed meat with plant-based proteins such as soy, other beans, and nuts may be associated with a reduced risk for coronary heart disease. This may be partly due to the replacement of saturated fats in red meat with unsaturated fats in plant-based proteins.<sup>9</sup> A 2018 review that looked at multiple clinical trials and observational studies found strong and consistent evidence that vegetarian, especially vegan, dietary patterns may prevent and reverse atherosclerosis and decrease other markers of cardiovascular disease risk, including blood pressure, blood lipids, and weight.<sup>10</sup> Researchers in a 2014 study put 198 patients with cardiovascular disease on a diet without fish, meat, dairy, or added oils. Eighty-nine percent of the participants adhered to the diet, and of that group, 81% improved their symptoms and experienced fewer complications from heart disease. In addition, they lost an average of 18 pounds, while 22% saw a complete reversal of their condition.<sup>11</sup>

*Fill Up on Fiber: The Added Advantage*

Soluble fiber slows the absorption of cholesterol and reduces the amount of cholesterol the liver produces. Oats, barley, beans, and some fruits and vegetables are all good sources of soluble fiber. Remember, fiber is found only in plants.<sup>12</sup> The average American adult eats only 10 to 15 grams of fiber per day, which is below the recommended daily amount of at least 20 to 35 grams per day. Eating more plant-based foods is the solution. A vegan diet easily adds more fiber into your meals from foods such as dried beans, lentils, peas, fruits, vegetables, and whole grains.

it is helpful to look for the percentage of calories from fat. In the leanest cuts of beef, about 30% of the calories come from fat. Skinless chicken is nearly as high at 23%. Most cheeses contain 60% to 80% of calories from fat, and ice creams often contain 45% to 65%. Butter, margarine, and oils of all types typically contain 95% to 100% of calories from fat. In contrast, nearly all grains, beans, vegetables, and fruits have less than 10% of their calories coming from fat.

However, not all fats are created equal. Beef, chicken, fish, and cheese contain saturated (“bad”) fat, which increases LDL cholesterol levels. Unsaturated fats do not have this effect. Saturated fats are solid at room temperature, whereas unsaturated fats are liquid. Two vegetable oils—palm and coconut oil—are also high in saturated fats. Some packaged foods contain hydrogenated oils—that is, oils that are chemically hardened to make them solid at room temperature to increase their shelf life. While liquid vegetable oils are much better than animal fats and tropical oils, all fats and oils are a combination of saturated and unsaturated fats. It pays to minimize them.

The chart below shows the percentages of saturated fat from different sources with animal fats and tropical oils containing a higher proportion than vegetable oils.

While you want to avoid saturated fat in order to reduce your LDL cholesterol level, you will also want to minimize unsaturated fats because, in excess, they can cause other health problems, including increased free-radical production, an impaired immune system, and increased body weight.

Animal Fats		Tropical Oils		Vegetable Oils <sup>6</sup>			
Beef Tallow	50%	Coconut Oil	87%	Canola Oil	12%	Safflower Oil	9%
Chicken Fat	30%	Palm Oil	49%	Corn Oil	13%	Sesame Oil	14%
Pork Fat (Lard)	39%			Olive Oil	13%	Soybean Oil	15%
				Peanut Oil	17%	Sunflower Oil	10%

### Maintain a Healthful Weight

Carrying excess weight can increase the risk for heart disease, especially when it is around the abdomen.<sup>13</sup> This visceral fat, which surrounds the organs in the abdominal area, can release dangerous chemicals, some of which increase the risk of heart disease. Subcutaneous fat is found under the skin and is not as hazardous. In 2008, a study in the journal *Obesity* determined that if obesity rates continue unchanged through 2030, 86.3% of adults will be overweight or obese, the prevalence of childhood obesity will double, and one out of every six health care dollars will go toward overweight- and obesity-related costs.<sup>14</sup>

### Keep Blood Pressure in Range

High blood pressure is also a common risk factor for heart disease and can lead to strokes and other serious health problems. Improving our eating habits can be a powerful way to lower blood pressure. One step is to minimize salt, which increases blood pressure. The Dietary Guidelines state that daily sodium intake should be less than 1 teaspoon or 2,300 milligrams; people over age 51 and/or those with high blood pressure should reduce their intake even more to 1,500 milligrams per day. On average, Americans consume around 3,400 milligrams per day. Cheese, deli meats, salty snacks, and other processed foods are some of the top sources of salt in the American diet. Numerous studies have shown that vegetarians and vegans have lower blood pressure than meat eaters. This could be because vegetarian and especially vegan diets are typically lower in fat and sodium and may have other blood pressure-lowering effects such as reduced blood viscosity, according to a 2014 meta-analysis.<sup>15</sup>

Some of these factors include the high amounts of potassium, magnesium, antioxidants, and fiber found in plant-based foods. The National Heart, Lung, and Blood Institute performed a study in which people consumed a low-fat diet rich in fruits and vegetables, also known as the Dietary Approaches to Stop Hypertension (DASH) diet. The results showed a drop in blood pressure, possibly due to the increased dietary levels of potassium and magnesium coming from fruits and vegetables.<sup>16</sup> Additional studies report that diets rich in fruits and vegetables also reduce blood pressure.<sup>17</sup>

An additional benefit is reduced iron storage in vegetarians. Studies have shown strong links between iron and heart disease and hypertension.<sup>18</sup>

### Avoid Smoking and Include Regular Physical Activity

People who smoke have a much higher risk of heart disease when compared with nonsmokers regardless of diet; therefore, quitting smoking is critical. A variety of physical activity is also important. Being active most days of the week helps one to avoid a sedentary lifestyle. Activities may include, but are not limited to, brisk walking, gardening, biking, swimming, boxing, dancing, body weight exercises, using resistance bands, or numerous other forms of movement.

Finally, stress takes a toll on the heart. Daily life is full of events

that cause our hearts to beat faster, drive up our blood pressure, and lead us to comfort foods that might do us more harm than good.<sup>19</sup> Reducing stress means trying to minimize sources of stress when possible so that they are manageable. Adequate rest and techniques for stress reduction such as meditating, deep breathing, talking with a close friend, and being physically active can be very helpful.

For a healthy heart, aim for an all-encompassing healthful lifestyle that incorporates a varied, low-fat, vegan diet, physical activity throughout the week, adequate sleep, and stress reduction.

### Reversing Heart Disease

On July 21, 1990, *The Lancet* published the groundbreaking findings of Dean Ornish, MD, who demonstrated that heart disease can actually be reversed without medications.<sup>20</sup> Patients who had arterial plaques that were clearly visible on angiograms were divided into two groups. One group received standard medical care prescribed for heart patients. The others began a low-fat vegetarian diet. They also began a program of modest exercise, avoided smoking, and managed stress through a variety of simple techniques.

Dr. Ornish's patients improved rapidly, and they continued to improve over the course of the study. While many patients experienced chest pain before the study began, "most of them became essentially pain-free," Dr. Ornish said, "even though they were doing more activities, going back to work, and doing things that they hadn't been able to do, in some cases, for years." After a year, 82% of the diet-group patients showed measurable reversal of their blockages.

The control group, following a more traditional medical route, did not do as well. For most patients, chest pain did not go away, but continued to get worse, and their plaques continued to grow, reducing blood flow to the heart more each day. Despite these findings and several studies since then, many doctors still recommend "chicken and fish" diets, even though heart patients who make such moderate dietary changes tend to worsen over time.

In summary, individuals who adopt a low-fat vegan diet, get daily physical activity, avoid tobacco, and manage stress stand the best chance of preventing and reversing heart disease. We now have powerful tools for gaining control over the health of our hearts.

### Suggested Reading

For more information on lowering cholesterol with a low-fat vegan diet, the Physicians Committee recommends

- *Dr. Dean Ornish's Program for Reversing Heart Disease* by Dean Ornish, MD
- *Prevent and Reverse Heart Disease* by Caldwell Esselstyn Jr., MD
- *Cooking for Your Heart and Soul* e-cookbook by the Association of Black Cardiologists

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