

# Controlling Cholesterol

## Increasing HDL *and* Lowering triglycerides *and* LDL

by Miles Hassell MD, co-author of *Good Food, Great Medicine*

The following six pages are excerpted from chapter four of *Good Food, Great Medicine*, an evidence-based guide for using the Mediterranean diet and your kitchen in the pursuit of optimal health. My sister Mea and I co-wrote this book as a practical tool for patients who are looking for simple steps to take to improve their health on an everyday level.

Chapter four, *Heart Disease: Preventing Heart Disease and Heart Attacks*, is built around a comprehensive 10-step plan (*See right hand side of page*) combining food, exercise, lifestyle, and medication/nutritional supplement decisions to prevent, treat – and potentially reverse – heart disease. This excerpt deals specifically with two of these steps, which focus on controlling cholesterol through food, exercise, and medication.

If you are interested in reading more about making better use of food and your kitchen, *Good Food, Great Medicine* is a practical easy-to-read resource for anyone wanting to eat well without sacrificing eating enjoyment. It presents the powerful medical evidence to support the case for a whole food Mediterranean-diet-and-exercise-based lifestyle. Mea simplifies the business of food and cooking with tips, humor, and over 140 easy-to-follow recipes. Readers are offered both the evidence and the tools to help them reverse the metabolic syndrome, prevent and treat type 2 diabetes, improve cholesterol levels, control high blood pressure, reduce risk of dementia and cancer, and lose weight without deprivation.

(*Good Food, Great Medicine*, is available for purchase at [Amazon.com](https://www.amazon.com), Powell's Books ([Powells.com](https://www.Powells.com)), Annie Bloom's Books, Providence Integrative Medicine Program [providence.org/integrativemedicine](https://www.providence.org/integrativemedicine) and our office. Our contact information is on the last page of this handout.)

### TEN CHOICES TO PREVENT AND REVERSE HEART DISEASE

1. Adopt a *whole-food* Mediterranean-style diet including oil-rich fish and fish oil
2. Make a habit of *daily* exercise
3. **Improve your HDL (good) cholesterol while lowering your triglycerides**
4. **Control your LDL (bad) cholesterol**
5. Control high blood pressure
6. Maintain a healthy waistline and weight
7. Prevent or reverse insulin resistance: high blood sugar, metabolic syndrome, pre-diabetes, and type 2 diabetes
8. Get adequate sleep
9. Be aware of the pros and cons of nutritional supplements – take vitamin D when necessary but be very cautious about other supplements
10. Use appropriate medications

## HEART CHOICE THREE

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### IMPROVE YOUR HDL AND LOWER YOUR TRIGLYCERIDES

**Goal: Raise HDL to more than 45 mg/dl for men and 55 mg/dl for women, and lower triglycerides to less than 150 mg/dl (less than 100 mg/dl may be optimal)**

Both low HDL and high triglycerides are important risk factors for heart disease, and the management of both disorders is similar. This section will combine the management of these two separate issues.

#### **HDL cholesterol explained briefly**

High density lipoprotein (HDL) is known as the ‘good’ cholesterol, and is one of the important predictors of future heart attacks – *the higher your HDL, the lower your risk*. For example, a person with an HDL of less than 35 mg/dl has a risk of future heart attack up to 3 or 4 times greater than a person with a high HDL, even if their LDL cholesterol is the same.

HDL is called ‘good’ for many reasons: it acts to transport cholesterol back to the liver (away from the arteries) and favorably alters the blood clotting process. HDL also helps protect LDL cholesterol from oxidation, which discourages the development of atherosclerosis.

Another way to make use of HDL in assessing risk is to use the ratio of total cholesterol (TC) divided by HDL: this is called the TC/HDL ratio. For TC/HDL, lower is better: aim for less than 4.

My recommendations for the HDL goals at the beginning of this section are based on the levels of HDL cholesterol associated with ‘average’ heart disease risk in the Framingham Offspring study,<sup>1</sup> and are somewhat higher than recommendations made by national organizations.

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<sup>1</sup> Castelli WP. Am Heart J. 1983;106:1191-1200

### Key HDL points to know

- **Treating low HDL usually requires many steps.** Most steps may raise HDL about 5 - 15 percent. When done together, these steps can increase total HDL by as much as 50 - 100 percent – or even higher.
- **Raising HDL by 7.5 percent** while controlling LDL is associated with regression of coronary artery atherosclerosis in several of the best heart disease prevention trials. This suggests that disease reversal is occurring.<sup>2</sup>
- **The benefit of raising HDL probably extends far beyond a reduction in heart disease risk.** Most of the changes that improve HDL are associated with lower risk of other diseases as well; stroke, high blood pressure, cancers, obesity, and diabetes.
- **Even tiny improvements in HDL are associated with reduced heart disease.** It is estimated that every 1 mg/dl improvement in HDL lowers heart disease risk by up to 4 percent. Thus, even an apparently modest 5 mg/dl increase in HDL may translate into up to 20 percent less heart disease risk.
- **In addition to total HDL testing,** part of a routine cholesterol panel, HDL subtype testing is available. We do not usually do this because the value is still being debated.

#### **Lowering triglycerides**

Triglycerides are another form of blood fat that relate to heart disease and stroke risk. In addition, high triglycerides often indicate an increased risk of developing diabetes or insulin resistance, which in turn also raises your risk of heart disease, stroke, dementia and some cancers. The risk associated with high triglycerides is even higher for women and people with diabetes. High triglycerides are also linked to a peculiar form of LDL cholesterol (small dense LDL) that particularly increases your risk of blocked arteries.

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<sup>2</sup> Nicholls S et al. JAMA 2007;297:499-508

## Eight important steps to raising HDL and lowering triglycerides

1. Make a habit of daily exercise.
2. Eat healthy fats. Low-fat diets usually increase triglycerides and lower HDL.
3. Use fish oil.
4. Avoid trans fats which can *lower* HDL (avoid hydrogenated oils).
5. Eat *more* minimally processed whole grains, beans, vegetables, and fruit. Eat *less* refined grains and sugar. (See list on page 10.)
6. Maintain a healthy waistline and weight
7. Drink a *small* amount of alcohol. *Limit to one drink per day.*
8. Use certain medications, particularly niacin.

■ **Daily exercise** raises HDL up to 10 - 20 percent and lowers your risk of future heart 'events' by 30 – 60 percent. About 30 - 60 minutes on most days is advisable, and any kind of exercise will do. For raising HDL, however, the longer the duration or greater the intensity of exercise, the better. As a good alternative to formal exercise, use a pedometer and make sure you accumulate 10,000 steps daily. The same benefit may apply to triglyceride levels.

■ **Eating more 'healthy fats'** is a good step towards raising HDL and lowering triglycerides. **A person with low HDL should be on a good fat diet, not a low-fat diet!** Some of the best fats are extra-virgin olive oil, avocado, raw nuts, and oily fish such as salmon, sardines, and tuna. Moderate amounts of eggs, cheese, butter, and meats also help raise HDL. Omega-3 fats help raise HDL a little bit, and are found in nuts, canola and soy oils, oily fish, shellfish, flaxseeds, and some green leafy vegetables.

■ **Using fish oil** may have a small effect in raising HDL, and a large effect in reducing triglycerides. The subject of fish oil is discussed more on page 45 and 52.

■ **Trans fats can lower HDL and raise triglycerides.** Trans fats are found in variable amounts in hydrogenated and partially hydrogenated oils, most margarines, many packaged foods, and in commercially prepared foods in general, often even those that say 'NO TRANS FATS'. (Legally a food can be said to have 'no trans fats' even when there is what I consider a significant amount of trans fats per serving.) So, I suggest you read labels carefully and avoid hydrogenated oils completely. They are generally nutritionally worthless anyway.

■ **Eating more minimally processed whole grains and beans and less refined grains and sugars** will help raise HDL and lower triglycerides. (Examples of refined grains and sugars are cold breakfast cereals, white rice, sweets and sweet drinks, and all white flour products.)

■ **Maintain a healthy waistline and weight.** Losing weight around the middle helps raise HDL 5 – 10 percent, and lowers triglycerides. Measure your waistline risk by calculating your waist-hip ratio. (See page 56 for why *Big waists can lead to bad hearts* and to find out your ideal ratio. Tips on weight loss are on page 30.)

■ **A small amount of alcohol** may help raise HDL up to 5 – 10 percent. If you do not have medical or philosophical reasons to avoid alcohol, consider drinking up to 1 drink per day. (See page 44.) Larger amounts of alcohol *raise* triglycerides.

■ **Medications for raising HDL and lowering triglycerides.** While lifestyle changes are very effective for lowering triglycerides in most people, medications can help a great deal. I advocate the use of niacin and fish oil because there is evidence that these improve health outcomes.

Unfortunately, some of the medications used to treat HDL and triglycerides have been associated with higher total death rates. When you discuss medications with your physician, I suggest that you request *only* medications that have been associated with less heart attacks and deaths. You would be surprised to discover how many prescription drugs used to treat cholesterol or triglycerides have *not* been shown to improve overall health.

### **Niacin, fish oil, statins, and fibrates**

The two main non-food items I use for treating low HDL cholesterol and high triglycerides are niacin and high-dose fish oil. When I use niacin and fish oil it is often in combination with a class of prescription drugs called statins, such as simvastatin, pravastatin, rosuvastatin, and atorvastatin. Another class of medications used to improve HDL and triglyceride levels are fibrates, including gemfibrozil and fenofibrate. I prescribe these very rarely, as their health outcomes data are not as favorable.

### **Niacin to raise HDL and lower triglycerides**

Niacin is a B vitamin (B<sub>3</sub>) and the most effective agent for raising HDL. Numerous studies have shown niacin therapy to significantly lower the risk of heart attack or death, particularly when used with a statin drug.

When used in therapeutic doses niacin can raise your HDL by 30 percent or more, lowers LDL by up to 20 percent, and lowers triglycerides by up to 40 percent. When combined with other cholesterol lowering medications, usually a statin drug such as simvastatin, niacin is associated with up to an **85 percent reduction in heart event risk.**<sup>1</sup> This combination provides a greater degree of benefit than is seen with any statin drug alone.

<sup>1</sup> Superko, R. *Circulation* 2008;117:560-568

### **Niacin is not for everyone**

*Consult with your physician to see if niacin is a good choice for you.* In the case of recent gout, active peptic ulcers, or some types of liver disease, the use of niacin would generally be avoided. Also, patients with diabetes can often see a rise in blood sugar when taking high-dose niacin.

### **How to use niacin**

Common side effects from niacin are flushing and itching and other skin symptoms which gradually go away. These reactions can be minimized by following these directions:

**For immediate release crystalline (non-prescription) niacin:** start with 250 mg with your evening meal. After one week, add another 250 mg at lunch. After another week, add another 250 mg at breakfast. Now you are taking 250 mg three times daily. If you are tolerating this dose of niacin, you can now increase the dose to 500 mg three times daily for a month. Some people can then increase the dose until they are taking 1,000 mg three times daily, and others get excellent results with just two doses daily. Immediate release niacin is the least expensive option, and works very well for those who can tolerate it.

**For extended release or slow release niacin** (like Niaspan, Endur-Acin, and Slo-Niacin): start with 500 mg at bedtime and increase by 500 mg every 2 - 4 weeks, for a maximum of 2,000 mg daily:

- **Niaspan** is *prescription* niacin and is used once a day at bedtime. Niaspan is also available combined with simvastatin, called 'Simcor', which combines the benefits of both a statin medication and niacin.
- **Endur-Acin and Slo-Niacin** (both non-prescription) are used one or two times daily with physician supervision. If using twice daily, close blood monitoring is required. Use only those which have been examined for

efficacy and safety in peer-reviewed studies, such as Slo-Niacin and Endur-Acin.<sup>1</sup>

### **Niacinamide and No-Flush Niacin**

(inositol hexanicotinate) are forms of niacin that do not effectively lower cholesterol.

**Whichever form of niacin you use, your doctor needs to be involved.** *Blood tests should be done after you reach a total daily dose of 1,000 mg, and then again after every 500 mg increase.*

### **Give niacin time!**

If you haven't used niacin before, it may seem like a nuisance. However, for most people with low HDL cholesterol, a treatment program including niacin appears to be the most beneficial in terms of reducing their risk of death or future heart attack, especially if niacin is combined with a statin medication. After a few weeks many people experience little or no side effects from niacin. Everyone is different. Some tolerate only small doses of niacin, like 500 – 1,000 mg daily, but even at lower doses there are very useful benefits.

### **Tips to reduce niacin side effects**

- Taking niacin with food, especially a high-fiber snack (like Metamucil or a piece of whole fruit) will also reduce the flushing. One combination that minimizes the niacin flush for some people is 2 - 4 tablespoons of oat bran mixed with unsweetened applesauce and eaten with the bedtime niacin dose. Another idea is to eat a handful of raw almonds or walnuts with the niacin.
- Do not increase your dose of niacin until you are tolerating the current dose.
- Aspirin helps reduce the side effects of niacin, so if you are taking aspirin, take it at the same time as your niacin.
- When you are first using niacin, avoid taking it with hot drinks, alcohol, or spicy foods, all of which can aggravate a reaction.

<sup>1</sup> Ito, M. et al *Pharmacotherapy* 2006; 26:939-1010

## **Using fish oil to lower triglycerides**

Fish oil has only a small effect on HDL or LDL cholesterol levels, but it does lower triglycerides substantially. Fish oil contains many types of fat, but what we are most interested in are the two fatty acids called EPA and DHA. When choosing fish oil, read the label to find out how much EPA + DHA it contains. (Some contain 30 percent while others contain 90 percent.) **A total of about 3,000 – 4,000 mg daily of EPA + DHA will lower triglycerides by 30 – 50 percent.** In order to get that dose you have a number of options:

- **Prescription fish oil:** 4 Lovaza capsules daily. It is expensive but convenient, as it has a higher percentage of DHA + EPA than most others so you can take less capsules. It is also the brand used in the most important fish oil study (GISSI).
- **Over-the-counter fish oil capsules:** these are usually lower concentration, and it takes up to 12 daily to get the required dose of EPA + DHA. These are best stored in the freezer, and taken before meals. It is fine to take them all just before your largest meal, to avoid fishy reminders.
- **Liquid fish oil:** this is the best option for many people. Generally 1 tablespoon daily of fish oil will provide the required dose of EPA + DHA, but read the label; some are more concentrated than others and there are a variety of flavors. Store in the refrigerator – using cold fish oil before your largest meal reduces the potential for unpleasant burping. Cod liver oil is a good choice, too, and gives you a useful dose of vitamin D at the same time. When using cod liver oil, check the label for the vitamin A content, and make sure you are not getting more than about 5,000 IU daily of vitamin A.

## HEART CHOICE FOUR

### CONTROL YOUR LDL (BAD) CHOLESTEROL

**Goal:** LDL of less than 160 mg/dl in low risk patients, and less than 100 mg/dl or even 70 mg/dl in high-risk patients  
(Ask your doctor what your target should be.)

Low-density lipoprotein (LDL) is a form of cholesterol strongly related to increased risk of heart disease, particularly in those who have other risk factors for heart disease. Although controlling LDL is important, don't rely solely on a low LDL to prevent a heart attack: most people who have heart attacks in the US are already at their recommended LDL goal.<sup>1</sup>

There are many drugs I use to lower LDL cholesterol. However, with consistent use of food choices you may not need medications at all, or you may get by with a smaller dose of medication, reducing expense and side-effects.

#### Mediterranean diet and LDL

In studies using the Mediterranean diet without the goal of lowering LDL, the LDL may stay the same or fall up to 10 percent. More importantly, the Mediterranean diet is associated with a reduction in LDL oxidation, a benefit which may be more important than simply lowering the total amount of LDL.

#### Some foods to lower LDL

When assessing the LDL-lowering effects of food, compare the expected effect with the fact that doubling any given dose of a statin drug will typically lower your LDL by only another 6 – 9 percent. Many patients use the foods mentioned on the following page in order to keep their statin dose low. LDL-lowering foods can easily be incorporated into your diet, and each could typically lower LDL by 5 – 10 percent. Using several measures together can lower your LDL cholesterol up

to 30 percent, an effect similar to that of a medium dose of a statin drug.

These LDL-lowering foods can also lower your triglycerides, raise HDL, improve your blood sugar control, and are associated with lower levels of inflammation. The more of these steps you take, the more of an improvement you will see in your LDL.

These foods do not work for everyone, unfortunately, but they can have some amazing results. A couple of our patients have seen their LDL cholesterol drop by 50 percent with the vigorous use of these foods. The higher your LDL, the better these foods work. Give any food program about 6 weeks to work.

#### ■ Psyllium (e.g. Metamucil) to lower LDL

A daily dose of 10 grams psyllium (about 2 heaping teaspoons) can sometimes reduce LDL by about 7 percent.<sup>2</sup> In some studies, psyllium has failed to lower LDL but has had a beneficial effect in raising HDL and lowering triglycerides.<sup>3</sup> Most people stir psyllium into water or juice. A method that works well is to stir it into a small amount of water, drink it quickly before it gels, and then follow with 12 ounces of water. Psyllium is a great anti-constipation agent, too.

#### ■ Oat Bran to lower LDL

Using 4 tablespoons (¼ cup) of oat bran each day may give about 10 – 26 percent reduction in LDL.<sup>4</sup> Oat bran can be added to cereal, stirred into yogurt or smoothies, or added to muffins. (See *Extreme Muffins* on page 236.)

#### ■ Raw almonds to lower LDL

About two handfuls of raw almonds (about 30 almonds or two ounces) daily can reduce LDL by 9 percent. Raw walnuts, hazelnuts, Brazil nuts, and pecans probably work as well. Adding raw nuts to your diet also has the important benefit of reducing oxidized LDL

<sup>1</sup> Sachdeva A et al. Am Heart J 2009;157:111-17

<sup>2</sup> Am. J. Clin. Nutr. 2000;71:472-9

<sup>3</sup> Sola, R. Am J Clin Nutr 2007;85:1157-63

<sup>4</sup> JACN 1998;17:601-608

as well as another risk factor called Lp(a).<sup>1</sup>  
(See *Heart disease risk factors not discussed in this chapter* on page 41.)

#### ■ Eggplant and okra to lower LDL

About 6 ounces of eggplant or about 3 – 4 ounces of okra every other day can also lower LDL. These foods have not been studied by themselves, but when used in combination with other factors, have been found to lower LDL by 28 percent. Inflammation was reduced as well.<sup>2</sup>

#### ■ Soy and other beans to lower LDL

Soy foods modestly reduce cholesterol. These are probably best included in the diet in the form of whole traditional soy foods such as soybeans (edamame), tofu, miso, and tempeh. (See recipes for soybeans and tofu on pages 158-60.) I am less enthusiastic about the highly refined soy products like soy milk. For those who use soy milk because of dairy intolerance, read the ingredient label carefully. Some other beans also lower LDL to a similar degree, particularly pinto beans. A half-cup of cooked pinto beans or 25 grams of soy protein will lower LDL 5 percent or more.<sup>3</sup>

#### ■ Stanols to lower LDL

There are a variety of stanol-containing margarines that can lower LDL cholesterol. I don't tend to recommend them because of concerns over the problems with hydrogenated oils in the margarine, and the debate over whether stanols at these doses have potential for harm.<sup>4</sup> Time will tell.

### Medications to lower LDL

Most people who need significant LDL lowering are also likely to need prescription medication, usually a statin. However, some people are able to control their cholesterol with a whole food diet enhanced on a daily basis with the foods described above.

<sup>1</sup> Circulation 2002;106:1327-32

<sup>2</sup> Jenkins JAMA 2003;290:502-510

<sup>3</sup> Winham DM et al. JACN 2007;26:243-9

<sup>4</sup> Fransen J Nutrition 2007;137:1301-6

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Miles' medical practice combines conventional and complementary approaches to the treatment and prevention of disease, emphasizing evidence-based nutritional lifestyle management in the context of a thorough traditional medical model.

He is co-author of *Good Food, Great Medicine*, an evidence-based guide to using the Mediterranean diet and your kitchen in the pursuit of optimal health.

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