LIPIDS

The American Heart Association and American College of Cardiology jointly released four new cardiovascular prevention guidelines in 2013, including updated cholesterol management guidelines.[1] Based on a thorough review of recent randomized controlled trials, the guidelines emphasize patient-centered management that focuses more on an individual’s overall health and risk for future cardiovascular-related morbidity as determined by a new cardiovascular risk calculator. There is less focus on attaining specific lipid levels. While cholesterol should still be considered along with other factors, the guidelines suggest there is little or no evidence to support using specific low-density lipoprotein-C (LDL-C) and non-high-density lipoprotein-C (HDL-C) levels as treatment goals. The stated aims of the new guidelines are as follows:

- Identify patients at risk
- Offer effective treatment that will help reduce risk of heart attack, stroke, and cardiovascular mortality
- Use the risk calculator to stimulate discussion between patient and practitioner about the best course of therapy.

Publication of the guidelines resulted in a firestorm of controversy, with concerns ranging from the potential for overestimating cardiovascular risk to a massive increase in the number of people who might now be prescribed statin therapy. Results from the REGARDS trial suggest the risk estimator actually functions well in the community setting.[2]

The guidelines do highlight the importance of diet and lifestyle modifications for the prevention and management of dyslipidemia, but moderate- or high-intensity prescription statin therapy is prioritized in at least the following patient populations:

- Known cardiovascular disease (CVD), including those with prior history of heart attack, stroke, angina, peripheral arterial disease, transient ischemic attack, or a history of arterial revascularization procedures
- Very high LDL-C (≥ 190 mg/dL) in people 21 years of age and older
- 40-75 years of age with type 1 or 2 diabetes mellitus (DM)
- 40-75 years of age with a risk of cardiovascular disease ≥7.5% without known cardiovascular disease.

For people who do not fit into any of the aforementioned categories, the guidelines recommend that prescription statin therapy also be considered in the presence of the following:

- Significant family history of premature cardiovascular disease
- High lifetime risk of atherosclerotic cardiovascular disease
- LDL-C ≥160 mg/dL
- High-sensitivity C-reactive protein (hs-CRP) ≥ 2
• Results from other testing, such as coronary artery calcium scoring or ankle-brachial index measurements.

Under the previous cholesterol guidelines, an individual’s 10-year risk for cardiovascular disease had to exceed 20% for statin therapy to be indicated generally, but the prior guidelines only considered risk for heart attack; the new guidelines also include stroke risk. The new recommendations also provide a path by which, for the first time, African Americans might better assess the cardiovascular risk profile in a way specific to them. This is also the case for young people, especially women, who are encouraged to estimate their lifetime cardiovascular risk and establish lifelong habits to reduce their risk as early as possible.

Wide acceptance of the new guidelines could result in millions of additional people being prescribed statins. Consider, for example, that the new recommendations indicate treatment is warranted for almost every elderly male; however, the authors again state that the recommendations are not intended as new thresholds for automatic and mandatory statin therapy. Rather, they are a starting point for discussion of therapeutic options with patients.

Cost associated with statin therapy has dropped considerably in recent years. As far as safety, statins are associated with the potential for accelerated development of diabetes in susceptible individuals, as well as reversible hepatotoxicity and myalgia. Proponents of statin therapy point out that even though adverse effects are possible, they are not, in and of themselves, life-threatening, as opposed to the disease process statins are meant to help prevent.

An emphasis on prevention is laudable, but the method(s) being promoted are controversial. Statins may offer benefits beyond lowering cholesterol levels, but many of those same benefits might be attained through comprehensive diet and lifestyle changes; statin therapy may be most effective as a means of reducing secondary cardiovascular risk. Fortunately, almost everyone supports the use of prudent diet and lifestyle modifications prior to or alongside pharmaceutical management. Abundant evidence shows that lifestyle modifications including diet, exercise, and not smoking have a significantly positive effect on reducing cardiovascular risk.[3-5]

Non-statin therapy may be considered for patients who experience side effects from statin therapy or who have to take other medications that may interact with statins; however, evidence for non-statin drugs (fibrates, niacin, bile acid sequestrants or ezetimibe) playing a significant role in reducing risk of heart attack or stroke is now considered weak.

**FOOD AND DRINK**

**THE MEDITERRANEAN DIET**

The Lyon Diet Heart Study found that eating a Mediterranean diet compared to a low-fat diet resulted in a 70% (12% versus 4%) reduction of heart events in those with...
documented heart disease.[6] This is three times more effective than statin drugs in preventing a secondary cardiac event.[7] A logical reason why nutrition trumps drug therapy for reducing cardiac events is that it provides the body many more benefits than simply blocking an enzyme that the liver uses to make cholesterol. The vegetables, fruits, fiber, and essential fatty acids help not only reduce cholesterol but also reduce inflammation, cancer risk, the development of arthritis, and Alzheimer’s disease. Nutrition enhances health of the whole body, not just the heart alone.

The PREDIMED study[8,9] enrolled over 7,000 Spanish study participants aged 55 - 80 years at high risk for CVD but not diagnosed with it. Participants were randomly assigned to one of three diets: a Mediterranean diet rich in nuts, a Mediterranean diet rich in extra virgin olive oil, or (for the active control group) a diet promoting a prudent reduction in dietary fat. The trial was stopped after a median follow up of 4.8 years because of early evidence of intervention benefit. The primary endpoint, a combination of stroke, heart attack, and cardiovascular deaths, was reduced compared to controls by 30% in the group randomized to a Mediterranean diet plus extra virgin olive oil, and by 28% in those adhering to a Mediterranean diet with nuts. An especially noteworthy benefit was a reduction in the incidence of stroke. PREDIMED also found a marked risk reduction for developing peripheral artery disease in both the Mediterranean diets supplemented with nuts (50%) and olive oil (34%).[10] A recent comparison trial showed that following a Mediterranean diet was more protective against sudden cardiac death in women than even the DASH diet.[11]

For an easy to follow food pyramid that defines key ingredients of the Mediterranean diet, visit the Oldways website.

- Typical components of the Mediterranean diet include the following foods:[12-16]
  - Olive and canola oils
  - Vegetables
  - Fruits
  - Legumes
  - Whole grains
  - Nuts and seeds
  - Fresh fish and seafood
  - Eggs
  - Moderate amounts of dairy (primarily yogurt and cheese)
  - Moderate quantities of red wine with meals
  - Minimal amounts of red and processed meat
  - Limited quantities of refined flours.

Healthy nutrition, regular exercise, and weight management are the most important influences on lowering cholesterol and preventing heart disease.
WATER-SOLUBLE, OR VISCOS, FIBER

Fiber that absorbs water does three things well in promoting health:

1. It reduces the absorption of cholesterol
2. It reduces the speed of absorption of carbohydrates or sugars (i.e., it lowers glycemic index). For more information, refer to “Glycemic Index.”
3. If taken before meals, it promotes weight loss by absorbing water and giving one a sense of being full (satiety).

Good sources of water-soluble fiber include the following:

PECTIN

Pectin is a fiber that binds to bile acids and to cholesterol, preventing their absorption. It is found in fruits, vegetables and seeds. Carrots, apples, and the white substance on the inner rinds of citrus fruits are excellent sources of pectin. A Scottish study found that eating two carrots a day decreased cholesterol by about 10%.[18]

OAT BRAN

Oat bran is also a water-soluble fiber that binds cholesterol and prevents absorption. A British study showed a 5% reduction in cholesterol with daily ingestion of oat bran cereal.[19]
**GROUND FLAXSEED**

Flaxseed also has the benefit of being rich in omega-3 fatty acids. The best and most cost-effective way to take flaxseed is to buy the seed in bulk and grind up a week’s worth in a coffee grinder. (Wipe the inside of the grinder after each use to prevent collection of rancid remnants). Once flaxseed is ground, it spoils quickly, so direct patients to store it in the refrigerator. Patients should aim for 1-2 tablespoons daily over salads, with cereal (oat bran), in smoothies, or with water/juice.

**BARLEY**

Barley contains water-soluble fiber including beta-glucan. This type of fiber comes from other sources as well, including wheat, fungi, and yeast. Barley has been shown to lower LDL cholesterol by about 10 points.[20] The barley in this study came from flakes, barley flour, and pearled barley instead of rice and wheat. For lowering cholesterol, 3 grams of barley oil extract, 30 grams of barley bran flour, or 0.4 to 6 grams of soluble fiber from barley were used.[21] Pearled barley, barley flour, flakes, or powder in doses of 3-12 grams daily have also been used to lower cholesterol.[21]

**NUTRITIONAL FIBER SUPPLEMENTS**

These can be taken at a dose of 1 tablespoon in 8-10 ounces of water daily or 1 teaspoon in 6-8 ounces of water before each meal. (For a list of good-quality supplemental fiber products, visit ConsumerLab [www.consumerlab.com](http://www.consumerlab.com)). Consider one (or more, as needed) of the following:

- Psyllium
- Methyl cellulose
- Guar gum
- Ground flaxseed

**Note:** Fiber can inhibit the absorption of pharmaceuticals as well as some vitamins and minerals such as calcium, iron, zinc, and vitamin B12. Advise patients not to take a fiber supplement within an hour of taking pharmaceuticals or supplements.

**SOY PROTEIN**

Diets with a higher amount of protein have been shown to reduce blood pressure and atherogenic cholesterol compared to diets high in carbohydrates. Soy protein has a greater effect on reducing LDL cholesterol than milk derived protein.[22] Soy contains lignan rich fiber, plant sterols (phytosterols), and isoflavones (genistein and daidzein), all of which have a positive effect on cholesterol through inhibiting absorption in the gut and increasing LDL cholesterol receptors for clearing and reducing oxidation of LDL cholesterol. Studies have shown a reduction of LDL cholesterol by 10.9% in people consuming hydrolyzed soy protein, as compared to a 5.9% reduction for total milk protein.[22] Not all studies on the effect of soy protein on elevated cholesterol have shown benefit, however.
The daily dose of soy protein for lowering cholesterol is between 20-50 grams. Approximately 10 grams of soy can be obtained from 1 to 2 cups of soy milk, 4 ounces of tofu, 1 ounce of soy flour, or 1/2 cup of textured soy protein. Eating the whole food is more beneficial than taking a soy supplement. Soy supplements contain isoflavones (such as genistein and daidzein) but tend not to include the fiber or plant sterols, which are needed to optimize soy’s effectiveness in lowering cholesterol.

**PLANT STEROLS AND STANOLS**

Sterols and stanols are fats found in plants foods such as fruits, vegetables, nuts, seeds, cereals, legumes, and vegetable oils (particularly soybean oil). They inhibit cholesterol absorption through the gut by approximately 50%.[23,24] Eating a Mediterranean diet that is rich in plant-based foods provides a rich source of plant sterols and stanols and is one of the best ways to lower cholesterol.

If a change in diet is difficult, functional food products containing plants sterols/stanols can be used to lower cholesterol. These include specially formulated spreads and fortified orange juice.

The beneficial dose of plant sterols/stanols in supplement form is 2-3 grams daily. One tablespoon of a fortified spread contains 0.85-1 gram of sterols/stanols. Two to three tablespoons of these spreads may lead to excessive calorie consumption, making weight loss difficult.

Beta-sitosterol is a plant-derived dietary supplement derived from plant stanols. Doses can range from 100-1000 milligrams based on the product available. The most effective dose is 700 milligrams to 1 gram 30 minutes before each meal.

**NUTS**

Nuts are an excellent source of omega-3 polyunsaturated fats, fiber, plant sterols, and flavonoids. These are all beneficial for cholesterol and heart health. Nuts are also high in calories, so individuals should eat no more than ¼ cup (1 ounce), or about a handful, daily unless they are trying to gain weight.[25]

Increasing nut consumption works best at lowering cholesterol if the nuts are consumed in place of saturated fats in the diet. When results were combined from four major epidemiological trials related to nutrition and the risk of heart disease, regular nut consumption reduced risk by an average of 37%.[26] As noted earlier, adding nuts to a heart-healthy Mediterranean diet offers added benefit in the primary prevention of CVD.[8,9]

**LEGUMES**

Legumes are pod-contained fruits. They include peas, beans, lentils, soy, and peanuts. A 2011 study found that along with a low calorie diet, and in some cases independent of the
diet, four servings of legumes per week reduced inflammatory markers, cholesterol, and blood pressure.[27]

**COMBINING BENEFICIAL FOOD GROUPS: THE PORTFOLIO DIET[28-30]**

The portfolio diet is a Mediterranean style eating plan that incorporates the nutritional ingredients described above. It has been found to reduce LDL cholesterol by about 30% (similar to 20 milligrams of the statin drug, lovastatin), when study participants are given the foods for the diet, and by 13% when they receive dietary recommendations alone.[29] However, the diet can be difficult to follow.

The portfolio diet (amounts for a diet of 2000 calories per day)

- 30 grams of almonds – about 23 almonds (1 ounce). Walnuts, cashews, Brazil nuts and macadamia nuts are also beneficial.
- 20 grams of viscous fiber from foods such as oats, barley, psyllium, and certain fruits and vegetables. (Less than 1 ounce.)
- 50 grams of soy protein from foods such as tofu, soy meat alternatives, and soy milk. As noted earlier, 10 grams of soy can be obtained from 1 to 2 cups of soy milk, 4 ounces of tofu, 2 ounces of soy flour, or 1/2 cup of textured soy protein
- 2 grams (0.064 ounces) of plant sterols from foods such as specially formulated spreads. Other sources include: avocado, soybeans, olive oil, and green leafy vegetables.
- Increased consumption of peas, beans, lentils, and peanuts (legumes).

**ESSENTIAL FATTY ACIDS**

Different fats affect cholesterol in different ways. In general, it is best to limit sources of saturated fat content of the diet, including meat, eggs, butter, whole milk, fried foods, and tropical oils such as palm and coconut oils. A reduction in cholesterol, triglycerides, and inflammation results from replacing saturated fats with monounsaturated fatty acids (MUFAs) and polyunsaturated fatty acids (PUFAs); however, keep in mind that experts have recently called into question the influence of dietary fats on CVD risk, stating that the real culprit is likely the plethora of highly processed, manufactured foods on store shelves, including processed meats.[31,32]

**MONOUNSATURATED FATTY ACIDS**

MUFAs (e.g., olive and canola oils, avocados, and nuts) lower LDL and may raise HDL. Olive oil is particularly useful because it contains squalenes that may help prevent colon, lung, and skin cancer.

**POLYUNSATURATED FATTY ACIDS**

Compared to monounsaturated fats, PUFAs are more effective at lowering triglycerides and overall cardiovascular risk.[18] The GISSI study of over 11,000 men with heart disease found that 850 milligrams of omega-3 fatty acids reduced the risk of sudden cardiac death
Polyunsaturated fats consist of omega-3 fatty acids and omega-6 fatty acids. The ratio of omega-6 to omega-3 fatty acids is important, and the ideal ratio is thought to be around 4:1. With the use of partially hydrogenated oils in cooking (these oils are also rich in trans-fatty acids), this ratio has increased to greater than 25:1. For the body to benefit from the anti-inflammatory effects of the omega-3 fatty acids, this ratio must improve. Advise patients to consume more omega-3 fatty acids and fewer omega-6 fatty acids. Both types of PUFA, however, are necessary in some quantities for optimal health.

- Omega-3 fatty acids are found in cold water fish, nuts, vegetables, flaxseed, soy, and hemp.
- Omega-6 fatty acids are present in partially hydrogenated vegetable oils used in foods with a long shelf life, such as chips, crackers, and cookies. Red meat and dairy are sources of both saturated fat and omega-6 fatty acids.

**FISH OIL VERSUS FLAXSEED OIL**

Fish oil contains the omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). In contrast, flaxseed needs to be metabolized to EPA and DHA, so it is not as efficient a source of DHA and EPA. For lowering triglycerides, supplemental doses of 3-4 grams of total EPA and DHA (from fish oil) are needed. Supplements with DHA and EPA derived from algae are also available. Ground flaxseed, while not an optimal omega-3 source, is a good source of fiber, which also has potential benefits. It is often taken at a dose of 1 tablespoon daily.

There is an inverse relationship between heart attack risk and the amount of EPA and DHA one consumed. The recommended daily dose of total EPA and DHA is 1000 milligrams for cardioprevention and up to 4000 milligrams daily for lowering triglycerides. When dosing for therapeutic benefit, it is important to look at the total amount of EPA and DHA in each capsule. This ratio is generally about 3:2 EPA to DHA. If 1 gram of fish oil capsule has 300 milligrams of EPA and 200 milligrams of DHA (a total of 500 milligrams EPA + DHA), a person will need to take 2 capsules to get 1 gram of omega-3 fatty acids.

FDA-approved fish oil capsules (available by prescription) contain 465 milligrams EPA and 375 milligrams DHA. For hypertriglyceridemia, a standard dose is 2 grams twice daily. Cost is high; 120 tablets cost around $170. The benefits of this formulation compared to over-the-counter fish oil are the higher concentration of EPA/DHA and the FDA monitoring of quality.

**NOTE:** Excessive burping of a fishy taste can suggest a spoiled product, which should be replaced. Freezing the capsules and taking them at night can also reduce this side effect.

**GARLIC**

A 2012 meta-analysis of 26 studies found that garlic significantly reduced total cholesterol and triglyceride levels but did not affect HDL and LDL. Compared with the placebo groups, serum total cholesterol and triglyceride levels in the garlic group were reduced by a
The benefits of garlic were greater for individuals who used it long-term and who had higher baseline total cholesterol levels. Garlic powder and aged garlic extract were more effective in reducing serum total cholesterol levels, while garlic oil was more effective in lowering serum triglyceride levels.

**ARTICHOKE**

Artichoke extract contains cynaroside and its derivative, luteolin. Both of these constituents seem to block HMG-CoA reductase, similar to statin medications. Encourage regular consumption of artichokes as a part of the Mediterranean diet.

**ARTICHOKE EXTRACT SUPPLEMENT**

There is some preliminary evidence supporting artichokes’ ability to lower LDL cholesterol by 23% over a 6-week period.[38] Other than inducing flatulence and the possibility of an allergic reaction, artichoke appears to be safe with no known drug-herb interactions.[39] It is best to eat the food, but if that is not possible, the extract can be taken at doses of 600 milligrams three times daily or 900 milligrams twice daily.

**GRAPES**

Grape products contain phenolic compounds, including oligomeric proanthocyanidins (OPCs), flavonols, and polyflavan-3-ols. These compounds do not have a significant influence on cholesterol but appear to be protective against heart disease, particularly in those who eat a diet high in saturated fat. One of the phenolic compounds found in grapes (particularly pinot noir wine), is called resveratrol. A study in the journal *Nature* found that rats fed a high saturated fat diet while given high doses of resveratrol significantly outlived those not given resveratrol. The resveratrol group also had improved coordination and stamina.[40,41] For humans to achieve a similar dose of resveratrol, they would have to drink 150-200 bottles of wine a day! Nonetheless, the beneficial phenols found in grapes may help explain the “French paradox.” Despite a high-fat diet, the French have a lower risk of heart disease, and this may be due in part to their wine consumption.[42] However, recently published human data do not suggest a significant impact on longevity or risk of heart disease or cancer from dietary resveratrol.[43]

Foods rich in polyphenols include olive oil, grapes, wine, blueberries, cranberries, bilberries, black currants, peanuts, green and black tea, onions, legumes, and parsley. Any blue, purple or dark colored grape or berry is rich in polyphenols.

**GREEN AND BLACK TEA**

One study showed a significant reduction in total and LDL cholesterol by 11.3% and 16.4%, respectively, after consumption of theaflavin-enriched tea extract.[44] Another study showed that both green and black tea extracts inhibit HMG-CoA reductase by phosphorylating the enzyme.[45] A recent systematic review found a significant moderate...
effect of green tea on total and LDL cholesterol levels.[46] Although these studies are promising, there is currently not enough evidence to recommend tea or tea extract for treatment of hypercholesterolemia. However, green tea has many other health benefits as well.

ALCOHOL

Moderate, as opposed to occasional, alcohol consumption has been shown to have a small but significant risk reduction in heart disease.[3] A moderate effect on HDL levels, with a raise of 12% has also been noted.[47,48] Although the incidence of ischemic stroke is reduced with moderate ethanol consumption, an increase in hemorrhagic stroke has been noted.[49] Significant medication interactions can exist with alcohol. Of course, a history of alcohol abuse, addiction, and/or pancreatitis must be considered when suggesting alcohol as an option to raise HDL.[50]

Encourage patients to incorporate the following foods into their diets to help lower cholesterol:

- Fruits: apples, citrus fruits, and dark-colored grapes and berries
- Vegetables: artichokes, avocados, beans, carrots, garlic, lentils, onions, peas, peanuts, soybeans, and other products made from soy
- Whole grains: barley, oat bran, and wheat
- Oils and spreads: canola oil, olive oil, and soybean oil
- Cold water fish: herring, mackerel, salmon, and sardines
- Beverages: beta-sitosterol fortified orange juice, green and black tea, and alcohol (especially red wine) no more than 1-2 drinks daily
- Other: ground flaxseed, mushrooms, and nuts

DIETARY SUPPLEMENTS

Note: Please refer to the Passport to Whole Health, Chapter 15 on Dietary Supplements for more information about how to determine whether or not a specific supplement is appropriate for a given individual. Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

RED YEAST RICE (RYR)

This supplement is made by fermenting white rice with the yeast *Monascus purpureus*. The fermentation process turns the yeast red and produces mevinic acids. One of these acids is called monacolin K, or mevinolin, a compound that is also found in the statin drug, lovastatin. These acids inhibit HMG-CoA reductase and reduce cholesterol production by the liver. In addition, red yeast also contains sterols, including beta-sitosterol (also found in vegetables), isoflavones (also found in soy), and monounsaturated fatty acids (also found in
olive oil). The cholesterol-lowering effects are likely due to the statin-like mevinic acids as well as other plant-based constituents.

A randomized trial compared 1) 40 milligrams of simvastatin plus reading an educational pamphlet to 2) red yeast rice at a dose of 1200 milligrams twice daily, plus fish oil (3.5 grams daily), and a 12-week program that emphasized the importance of a Mediterranean diet, exercise and relaxation. After 12 weeks, there was a 39% reduction of LDL in the simvastatin group and a 42% reduction in the RYR/lifestyle group.[51] Research in China has shown that people who had a previous myocardial infarction who received RYR had a lower incidence of cardiac events and death.[52]

The recommended dose of RYR is 1200 to 1800 milligrams twice daily; 3.6 grams of RYR contains the equivalent monacolin K to 6 milligrams of lovastatin. Inappropriate fermentation practice can result in the chemical citrinin, which is a nephrotoxin.

A list of products that have been found to have the amount of active ingredients stated on their labels without containing any of the toxin citrinin are listed on the ConsumerLab website at www.consumerlab.com.

**NOTE:** Although Red Yeast Rice appears to be associated with fewer cases of myopathy,[53] it can still cause muscle pain, as well as hepatotoxicity. It shares the same side effect profile as other statin medications, and liver enzymes should be monitored.

**NIACIN**

Based on findings from AIM-HIGH[54] and HPS2-THRIVE[55] trials, and given its potential for side effects, niacin now appears not to be helpful in the management of hyperlipidemia beyond having the potential for increasing HDL-C. For that matter, some experts are questioning whether increasing HDL-C levels has a meaningful impact on reduction of cardiovascular risk at all.[56,57]

**TABLE 1. SUMMARY OF LIPID EFFECTS[17]**

<table>
<thead>
<tr>
<th>Food, Drinks, and Supplements</th>
<th>LDL Cholesterol</th>
<th>HDL Cholesterol</th>
<th>Triglycerides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber</td>
<td>5-26% Decrease</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Soy</td>
<td>10% Decrease</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Plant Stanols/Sterols</td>
<td>5-17% Decrease</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Nuts (Walnuts)</td>
<td>8-16% Decrease</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Fish Oil</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>20-50% Decrease</td>
</tr>
</tbody>
</table>
### Lipids

<table>
<thead>
<tr>
<th>Food, Drinks, and Supplements</th>
<th>LDL Cholesterol</th>
<th>HDL Cholesterol</th>
<th>Triglycerides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garlic</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>13% Decrease</td>
</tr>
<tr>
<td>Artichoke Extract</td>
<td>Up to 23% Decrease</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Red Yeast Rice</td>
<td>25-35% Decrease</td>
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</tr>
<tr>
<td>Alcohol (1-2 drinks/day)</td>
<td>Not applicable</td>
<td>12% Increase</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Above chart adapted from "Nondrug Ways to Promote Health by Lowering Cholesterol," University of Wisconsin Integrative Medicine Website.[17] Note that niacin has been removed from the table given recent study findings questioning its benefits.

**AUTHOR(S)**

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