

Triglycerides: Frequently Asked Questions

Why are triglycerides important?

The amount of triglycerides (or blood fats) in blood are one important barometer of metabolic health; high levels are associated with coronary heart disease, diabetes and fatty liver disease. Metabolism refers to the chemical process that converts the food we eat into the energy our cells need.

Other measures of metabolic health that increase the risk of coronary heart disease include too much LDL cholesterol – the “bad” cholesterol and too little HDL cholesterol – the “good” cholesterol. Other important risk factors include total and LDL cholesterol.

1. What roles do triglycerides play in cardiovascular disease risk?

Triglycerides provide unique information as a marker associated with the risk, for heart disease and stroke, especially when an individual also has low HDL- cholesterol (the good cholesterol) and elevated levels of LDL (the bad cholesterol).-C. More research needs to be conducted to say that triglycerides are unequivocally an independent risk factor for CVD. Here’s what we know so far:

- Case-control studies have shown that triglycerides could be an independent cardiovascular disease risk factor. A case-control study is an analytical study which compares individuals who have a specific disease ("cases") with a group of individuals without the disease ("controls"). The proportion of each group having a history of a particular exposure or characteristic of interest is then compared.
- Prospective population based cohort studies –A recent study concluded that in younger persons the highest levels of triglycerides corresponded with a four times greater risk of heart disease and stroke risk compared to similar patients in the study who had the lowest levels of triglycerides. (*Tirosh et al, Ann Intern Med 2007*)
- Clinical trials – Although no clinical trials have been primarily designed to examine the effect of triglyceride reduction on heart attacks, stroke or other cardiovascular causes of death deaths, subgroups with high triglycerides tend to derive benefit when they receive therapies to lower their cholesterol levels.

2. How should individuals decrease triglycerides (TG)?

Even if people have not been diagnosed with triglycerides outside the normal range, if they eat too many simple sugars (refined grains, added sugars and alcohol) their triglycerides will

increase. Everyone – whether or not they have high triglycerides -- should focus on fiber-rich complex carbohydrates, such as vegetables and whole grains, instead of simple sugars. Here are some important lifestyle habits to keep triglycerides low and lower triglycerides if they are above the normal range:

- Lose weight – there is evidence that a 5-10 percent weight loss results in a 20 percent decrease in triglycerides – the magnitude of decrease in triglycerides are directly related to the amount of weight lost.
- Monitor the quality of foods you eat – A healthy eating pattern limits intake of sodium (salt), solid fats (such as full fat dairy products, meat and some tropical oils, such as coconut oil), added sugars, and refined grains and emphasizes more nutritious foods and beverages—vegetables, fruits, fiber-rich whole grains, fat-free or low-fat milk and milk products, seafood, lean meats and poultry, beans, nuts and seeds.
- The type of carbohydrates that you eat makes a difference – Foods that contain high amounts of simple sugars, especially fructose raise triglyceride levels.
- Saturated and Trans fats raise triglycerides – Unsaturated fats, especially omega-3's that are found in fatty fish, lower triglyceride levels.
- Alcohol – Alcohol in high amounts increases triglyceride levels in some people. In individuals with very high triglycerides, abstinence from alcohol is recommended in concert with reduced saturated fat intake.
- Physical Activity plays an important role in lowering triglycerides – The effects that physical activity has on triglyceride levels vary depending upon baseline triglyceride level, level of intensity, caloric expenditure and duration of activity.

3. Is body fat distribution important?

Visceral obesity is especially important because it is strongly associated with insulin resistance (an inability of the body to use insulin to convert food into energy) and high levels of triglycerides. Visceral fat lies deep inside the abdomen, near the waistline surrounding the abdominal organs. The best way to lose this fat is to lose excess weight by eating a healthy diet along with getting regular physical activity. Physical activity helps reduce abdominal fat and preserve muscle during weight loss. The amount of physical activity to achieve a healthy weight varies from person to person.

4. What does the AHA recommend for hypertriglyceridemia?

Factors such as body weight, body fat distribution, weight loss, and the type and amount of dietary carbohydrate and fat, as well as alcohol consumption play an important role in treating high levels of triglycerides. The AHA recommends changes in lifestyle habits as the main therapy for hypertriglyceridemia. These are the changes you need to make:

- If you're overweight, cut down on calories to reach your ideal body weight. This includes all sources of calories, from fats, proteins, carbohydrates and alcohol.
- Reduce the saturated fat, trans fat and cholesterol content of your diet.

- Reduce your intake of alcohol. Even small amounts of alcohol can lead to large changes in plasma triglyceride levels.
- Eat fruits, vegetables and nonfat or low-fat dairy products most often.
- Get at least 30 minutes of moderate-intensity physical activity on five or more days, for a total of at least 150 minutes per week.
- People with high triglycerides should substitute monounsaturated and polyunsaturated fats —such as those found in canola oil, olive oil or liquid margarine —for saturated fats.
- Substituting carbohydrates for fats may raise triglyceride levels and may decrease HDL ("good") cholesterol in some people.
- Keep dietary fat to 25-35% of total diet.
 - If you eat many complex carbohydrates, as demonstrated by DASH (Dietary Approaches to Stop Hypertension, http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf) dietary eating plan, you'll be on the low end of the total fat range. Some people may wish to stay near the high end of the range in order to decrease triglycerides. These individuals must be sure to incorporate healthy fats into their eating pattern. Although the DASH diet was originally developed as a diet to lower blood pressure, the American Heart Association recommends it as an example of a healthy dietary pattern.
 - In order to incorporate healthy fats into the diet, substitute fish that is high in omega-3 fatty acids for meats high in saturated fat, such as steak or hamburger. Fatty fish like salmon, herring, sardines, lake trout, and albacore tuna are high in omega-3 fatty acids.
- Control high blood pressure and avoid cigarette smoking.
- If a patient is taking drugs as prescribed by his or her healthcare provider to treat hypertriglyceridemia, dietary management is still important because, combined with drug therapy, lifestyle changes such as weight loss, increased physical activity and dietary modifications are highly effective and work well in concert with drug therapy. Patients should follow the specific plans laid out by their physicians, dietitians and nutritionists.

5. Do high-carbohydrate diets increase triglycerides and risk for cardiovascular disease?

Evidence from a statement released by the National Heart, Lung and Blood Institute, panel on Detection, Evaluation, and treatment of High Blood Cholesterol in Adults (ATP III), suggests that very high intakes of carbohydrates (CHO) (greater than 60 percent of total calories) are accompanied by a rise in triglycerides.

The recommendation by ATP III regarding dietary "Carbohydrate intakes should be limited to 60 percent of total calories. Lower intakes (e.g., 50 percent of calories) should be considered for persons with metabolic syndrome who have elevated triglycerides or low HDL cholesterol (the good cholesterol).

6. What is metabolic syndrome?

The metabolic syndrome is defined by a cluster of easily measured metabolic factors, which occur together. Metabolic syndrome occurs when a person has 3 or more of the following 5 factors: elevated waist circumference, elevated triglycerides, reduced HDL-C, elevated blood pressure, elevated fasting glucose. Metabolic syndrome develops in the setting of excess calories and a sedentary lifestyle with underlying causes being obesity and insulin resistance. When considered as a cluster, the metabolic abnormalities that the cluster represents are greater than the sum of the individual parts.

Most studies show that the metabolic syndrome is associated with an approximate doubling of heart disease and stroke risk and a five times greater risk for developing type 2 diabetes. Although the individual components of the metabolic syndrome can be managed with medications, lifestyle modifications, including increasing physical activity and weight loss are key to reducing risk from the metabolic syndrome, since they improve all of the components of the metabolic syndrome.

For more information on the metabolic syndrome, see:

Alberti KGMM, et al; Harmonizing the metabolic syndrome: a joint interim statement of the International Diabetes Federation Task Force on Epidemiology and Prevention; National Heart, Lung, and Blood Institute; American Heart Association; World Heart Federation; International Atherosclerosis Society; and International Association for the Study of Obesity. Circulation 2009; published online before print October 5, 2009, 10.1161/CIRCULATIONAHA.109.192644.

<http://circ.ahajournals.org/cgi/reprint/CIRCULATIONAHA.109.192644>

7. How can individuals change the way they eat to improve their triglyceride levels?

All people, whether or not they have high triglycerides, should limit their intake of added sugars. If a person has triglycerides that are outside the normal range it is especially important to limit daily calories from added sugar to no more than 5 percent to 10 percent (no more than 100 calories for most women and no more than 150 calories per day for most men). Sugar has no nutritional value other than to provide calories. To ensure proper nutrient intake in the diet and limit excess calories, people should be sure foods high in added sugars are not taking the place of foods with essential nutrients or are increasing their total calorie intake.

Added sugars are sugars and syrups that are added to foods or beverages during processing or preparation. They do not include naturally occurring sugars such as those found in milk (lactose) and fruits (fructose). For those people above 150 mg/dL triglycerides, limit fructose and work with your healthcare provider to monitor your fructose intake, and emphasize more vegetables and fruits that are lower in fructose.

8. What foods and beverages are the main sources of added sugars in Americans' diets?

Regular soft drinks, fruit drinks (fruitades and fruit punch), desserts (cakes, cookies, pies), syrups and jellies, candy, ready to eat cereals, milk based products such as sweetened yogurts, sweet milk, and

ice cream, and grain products like sweet rolls and cinnamon toast. High fructose corn-syrup is 55% fructose, and 45% glucose - not 100% fructose.

9. Why are you singling out beverages and why are they so important?

People who consume large amounts of beverages with added sugars tend to consume more calories overall and tend to gain weight. A major contributor of added sugars to American diets is sugar sweetened beverages. Currently, it is estimated that soft drink consumption alone accounts for one third of added sugars intake in the U.S. diet.

Added sugars (or added sweeteners) include natural sugars (such as white sugar, brown sugar, honey, etc.) as well as other caloric sweeteners that are chemically manufactured (such as high fructose corn syrup, maltodextrin, etc).

Americans should limit their intake of sugary beverages. AHA recommends consuming no more than 36 ounces of sugar-sweetened beverages per week, based on a 2000 calorie per day diet.

10. Are some sugars worse than others?

In addition to limiting added sugars, those with triglycerides outside the normal range should limit fructose consumption to 50 to 100 grams per day, because fructose raises triglycerides. Fructose, or fruit sugar, is a simple monosaccharide (type of sugar) found in many foods and fruits. It is one of the three important dietary monosaccharides, along with glucose and galactose. It is part of the chemical structure of sucrose, or table sugar.

According to USDA data, a 12-ounce cola has 22g of fructose, 1.5 oz raisins have 13g of fructose, and an apple has 4-10g of fructose. Limiting fructose may be difficult because fructose is not listed on the nutrition facts panel. See the table below from the scientific statement on Triglycerides and CVD, for information on fructose in certain food products. To find out more information about the fructose content in selected foods, visit the USDA nutrient database:

http://www.nal.usda.gov/fnic/foodcomp/cgi-bin/list_nut_edit.pl.

Common sources of fructose

Item	Amount (grams)
Cola or Lemon-Lime Soda (12 oz)	22 g
Ginger Ale with HFCS (12 oz)	17 g
Raisins (1.5 oz box)	13 g
Agave Nectar (tbls)*	8.9 g
Honey (tbls)	8.6 g
Applesauce (3.5 oz)	8 g
Fruit (apple, pear)	4–10 g
Molasses (tbls)	2.6 g
Table sugar (tsp)	2 g

**data obtained from reference 528*

11. How do I know how much sugar is added to my food?

There is no place on the nutrition label that currently lists the amount of added sugars in a product. The line for “sugars” you see on a nutrition label includes both added and natural sugars in the product. Naturally occurring sugars are found in milk (lactose) and fruit (fructose). Any product that contains milk (such as yogurt, milk, cream) or fruit (fresh, dried) contains some natural sugars. However, reading the ingredient list on a processed food’s label can tell you if the product contains added sugars.

Names for added sugars on labels include:

- Brown sugar
- Corn sweetener
- Corn syrup
- Sugar molecules ending in “ose”
(dextrose, fructose, glucose, lactose, maltose, sucrose)
- High-fructose corn syrup
- Fruit juice concentrates
- Honey
- Invert sugar
- Malt sugar
- Molasses
- Raw sugar
- Sugar
- Syrup

12. Do sugars cause high triglycerides?

Yes. Added sugars intake does appear to be connected with increased triglyceride levels, a known risk factor for developing heart disease.

Eating added sugars often means a person is consuming less fiber. This is important because increasing fiber in the diet is associated with decreasing energy intake (calories), which can result in weight loss. For those who are at a greater than ideal body weight, weight loss is an important therapy for lowering triglycerides.

Fructose is metabolized differently than other sugars such as glucose. Because it may raise triglycerides, its use should be limited if levels are outside the normal range (See question 11).

13. Why is the new optimal level of fasting triglyceride levels lower than before at 100mg/dL?

High triglycerides are one of the components that define the metabolic syndrome, a collection of easily measured variables that increase the risk for atherosclerosis, the disease process that narrows arteries and underlies heart disease. Lowering triglycerides to within the normal range of less than 150 mg/dL with lifestyle change has been shown to reduce triglyceride’s contribution to the metabolic syndrome as well as other metabolic risk factors for heart disease, such as cholesterol abnormalities. When an individual has high triglycerides, they should be seen as a signal for the clinician to place major emphasis on lifestyle change with their patients.

For improved metabolic health and protection to the heart and blood vessels, the American Heart Association now recommends an optimum fasting triglyceride level of 100 mg/dL. This puts an even stronger emphasis on lifestyle change which has been the recommended therapy for mildly elevated triglycerides.

However, the American Heart Association does not recommend people use drug therapy to achieve this optimal level because there has not been adequate study to show that drug therapy to lower triglycerides to this level is helpful. Many people will be able to reduce their triglycerides as well as other metabolic risk factors such as elevated blood sugar and elevated blood pressure with diet, weight loss and increased physical activity.

14. Is there a recommendation for drug therapy?

Although severe elevations of triglycerides 500 mg/dL or more are unusual, these patients may require medications to reduce the risk of acute pancreatitis. For those patients with fasting triglycerides in the 200-499 mg/dL range, there are circumstances where after LDL cholesterol is lowered to goal, additional medication may be required to lower additional markers of risk such as elevated non-HDL cholesterol. This current statement focuses not on drug therapy, but on lifestyle change with its promise to improve not only triglycerides, but metabolic health generally with improved waistlines, lower blood pressure and blood sugar and possibly higher HDL cholesterol as additional benefits.

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