

# Eating, Diet, & Nutrition for **CHOLESTEROL**

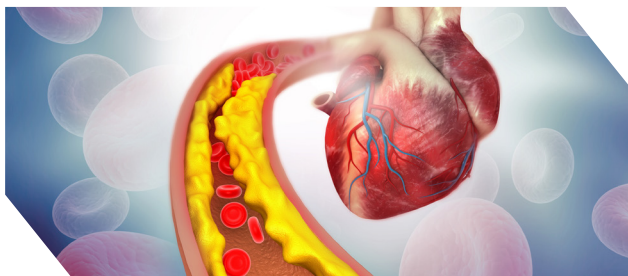


مؤسسة الرعاية الصحية الأولية  
PRIMARY HEALTH CARE CORPORATION

الخطوة الأولى لصحة عائلتك  
The First Step to your Family's Health

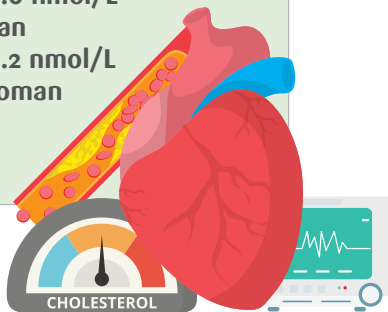
## What is Cholesterol?

Cholesterol is a fatty substance which is made in the liver. It's found in some foods too. We all need some cholesterol in our bodies just to keep us ticking over but having too much can clog up your arteries and lead to health problems in the future. By getting a simple cholesterol test and making positive lifestyle changes, most people can keep their cholesterol levels healthy.



## Desirable level

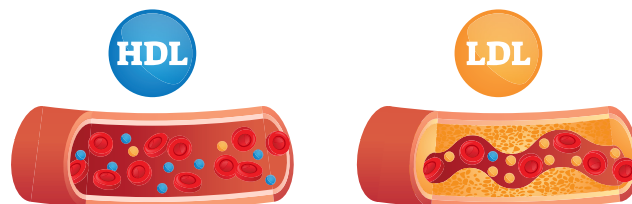
Total (serum) cholesterol	<b>below 5.2 nmol/L</b>
<b>LDL CHOLESTEROL</b>	<b>below 3.36 nmol/L</b>
HDL CHOLESTEROL	<b>above 1.0 nmol/L for a man</b> <b>above 1.2 nmol/L for a woman</b>



## What is the job of Cholesterol?

- It's part of the outer layer, or membrane, of all your body's cells
- It's used to make vitamin D and steroid hormones which keep your bones, teeth and muscles healthy
- It's used to make bile, which helps to digest the fats you eat

## What are the common types of cholesterol?



### LDL cholesterol (low density lipoprotein):

This is often called bad cholesterol, because too much in the blood can lead to health problems. These lipoproteins contain lots of cholesterol. Their job is to deliver cholesterol to the cells where it's needed. But if there's too much LDL cholesterol in your blood it can build up in the arteries, clogging them up.

### HDL cholesterol (high density lipoprotein):

This is often called good cholesterol because it helps prevent disease. They contain lots of protein, and very little cholesterol. HDL cholesterol's job is to carry cholesterol away from the cells, back to the liver, where it can be broken down and removed from the body.

### VLDL (very low-density lipoproteins):

These are larger. They carry triglycerides plus some cholesterol from the liver around your body. They contain lots of fat and very little protein. If there is too much VLDL in your blood, fat can be laid down in your artery walls, clogging them up.



## What raises your cholesterol?

- A diet high in saturated, trans, and hydrogenated fats
- Not being active enough, so the fats you eat aren't used up for energy
- Genetic conditions which mean the fats aren't processed in the usual way.

## HDL levels differ for men and women

Women naturally have higher HDL cholesterol (good cholesterol) levels than men. This is due to differences in the genes.

Women should aim for an HDL cholesterol level above 1.2mmol/L while men should aim for above 1mmol/L

## What is Triglycerides?

Triglycerides are another type of blood fat and your triglyceride levels can tell you more about your health. If your triglycerides are high, it can mean you're at risk of heart disease, liver disease and diabetes.

**FASTING TRIGLYCERIDE**

**below 1.7mmol/L**

## When should I have a cholesterol check?

- You are aged 40-74
- You are at high risk of heart disease
- You have been diagnosed with heart disease
- You are taking medicines to lower your cholesterol
- You have a close relative with familial hypercholesterolemia



## Medical Nutrition Therapy of Dyslipidemia

- The nutrition guidelines from the National Cholesterol Education Program's Adult Treatment Panel III (ATP III) are called Therapeutic Lifestyle Changes (TLC).

## The main points of TLC -Therapeutic Lifestyle Changes

are as follows

- **TLC is a low-saturated-fat, low-cholesterol eating plan that calls for <7% of total daily energy from saturated fat,**
- **Limit sodium intake 2400mg/day and <200 mg dietary cholesterol per day.**
- **The TLC diet recommends only enough energy to maintain a desirable weight and avoid weight gain.**
- **In case, LDL cholesterol levels are not lowered enough by reducing saturated fat and cholesterol intakes, the amount of soluble fiber in the meal plan should be increased.**
- **Certain food products that contain plant stanols or plant sterols (for example, cholesterol-lowering margarines and salad dressings) can also be added to a TLC diet to boost its LDL cholesterol-lowering power.**

### A. FOODS LOW IN SATURATED FAT INCLUDE THE FOLLOWING:

- Fat-free or 1% fat dairy products
- Lean meats
- Fish
- Skinless poultry breast
- Whole grain foods
- Fruits and vegetables
- Look for soft margarines (liquid or tub varieties) that are low in saturated fat and contain little or no trans-fat (another type of dietary fat that can raise cholesterol levels)
- Follow a diet rich in flavonoids, phenols, sterols and antioxidant as half cup of nuts daily or 5 oz. /week (almonds high source of vitamin E, walnut contains ALA).



- Consume Antioxidant from dietary sources (vitamin E foods include Asparagus, spinach, wheat germ and nuts)



- Vitamin C foods should be consumed in amounts that meet daily reference intake (DRI) levels.
- Use flavonoids from Tea, blueberries, yellow onion, grape juice, and apple, cocoa and dark chocolate.
- Include dietary phytonutrient (fruits, vegetables, whole grains, nuts, beans, and green tea) they decrease endothelial inflammation and risk of oxidative steep.

### B. LIMIT FOODS SUCH AS THE FOLLOWING:

- Sugar and high refined flours, processed foods
- Hydrogenated oil and fried foods.
- Liver and other organ meats
- Full-fat dairy products



### C. GOOD SOURCES OF SOLUBLE FIBER INCLUDE THE FOLLOWING:

- Oats
- Barley
- Certain fruits (such as oranges and pears)
- Vegetables (such as Brussels sprouts, peas and carrots)
- Dried peas and beans (legumes)

### D. WEIGHT MANAGEMENT:

Weight loss can help to lower LDL cholesterol in persons with overweight. It is especially important for those with a cluster of risk factors called metabolic syndrome, which includes high triglyceride and/or low HDL cholesterol levels and overweight with a large waist circumference (>40 inches for men and >35 inches for women).



### E. PHYSICAL ACTIVITY:

- People at high risk of CVD should be encouraged to do at least **150 minutes of moderate intensity activity or 75 minutes of vigorous intensity aerobic activity per week.**
- Muscle strengthening activities are recommended: do at least two activities per week that work all the major muscle groups (legs, hips, back, abdomen, chest, shoulder, and arms).
- If, after following the TLC guidelines LDL cholesterol goals have not been reached, a physician may prescribe other treatment to reduce LDL
- The treatment includes losing weight if needed, increasing physical activity, quitting smoking, and possibly taking medication.



### F. TYPES OF FAT:

- **Saturated fat:** It is mostly in animal foods, such as milk, cheese, and meat. Poultry and fish have less saturated fat than red meat. Saturated fat is also in tropical oils, such as coconut oil, palm oil, and cocoa butter. You'll find tropical oils in many snacks and in non-dairy foods, such as coffee creamers and whipped toppings. Foods made with butter, margarine, or shortening (cakes, cookies, and other desserts) have a lot of saturated fat. Saturated fat can raise your cholesterol.



- **Trans fat:** Some animal-based foods have small amounts of naturally occurring trans fats. Most trans-fat comes from partially hydrogenated oils (PHOs) such as:

- Margarine.
- Vegetable shortening.
- Packaged snacks.
- Baked foods, especially premade versions.
- Ready-to-use dough.
- Fried foods.
- Coffee creamers, both dairy and nondairy



**Trans fat can raise your cholesterol, so eat as little trans-fat as possible.**

- **Unsaturated fat:** Unsaturated fat is liquid at room temperature. It is mostly in oils from plants. Try to include mostly unsaturated fats.
- **Monounsaturated fat:** This fat is in avocado, nuts, and vegetable oils, such as canola, olive, and peanut oils.
- **Polyunsaturated fat:** The two types of polyunsaturated fats are omega-3 and omega-6 fatty acids.
  - Omega-3 fatty acids are found in foods from plants like soybean oil, canola oil, walnuts, and flaxseed. They are also found in fatty fish and shellfish as eicosatetraenoic acid (EPA) and docosahexaenoic acid (DHA). Salmon, anchovies, herring, sardines, Pacific oysters, trout, Atlantic mackerel, and Pacific mackerel are high in EPA and DHA and lower in mercury.
  - Omega-6 fatty acids are found mostly in liquid vegetable oils like soybean oil, corn oil, and safflower oil.



Diet plan

# 1,500 CALORIES

Choose one option from each group



MEAL	FOOD GROUPS	SERVING SIZE
BREAKFAST	<ul style="list-style-type: none"> <li>• <b>Carbohydrate Group:</b> 2 whole grain (toast or ½ bread) or 1 cup whole grain breakfast cereal or oats</li> <li>• <b>Protein Group:</b> 1 egg or 2 tablespoon cheese, 2 tablespoons low fat labneh</li> <li>• <b>Milk Group:</b> ½ cup low fat milk, yogurt</li> <li>• <b>Vegetables Group:</b> 1 cup slices of tomato, cucumber and lettuce</li> <li>• <b>Fat Group:</b> 1 Teaspoon olive oil or 8 small olives or 6 almonds, or 2 tablespoon avocado or ½ table spoon peanut butter</li> </ul>	Carbohydrate Group: 2 Protein Group: 1 Milk Group: ½ Vegetables Group: 1 Fat Group: 1
SNACK 1	<ul style="list-style-type: none"> <li>• <b>Fruit group:</b> 1 medium size fruit (1 Apple or 1 orange or 1 guava or ½ banana or 2 tangerine or 12 grapes)</li> </ul>	Fruit Group: 1
LUNCH	<ul style="list-style-type: none"> <li>• <b>Carbohydrate Group:</b> 2/3 cup of rice or 2/3 cups macaroni or ½ whole grain bread or 2 small potatoes</li> <li>• <b>Protein Group:</b> 60 g chicken or fish without skin (grilled or cooked)</li> <li>• <b>Vegetables Group:</b> 1 cup fresh salad and 1 cup cooked vegetables</li> <li>• <b>Fat Group:</b> 2 Teaspoons vegetable oil for cooking or salad</li> <li>• <b>Fruit Group:</b> 1 medium size fruit</li> </ul>	Carbohydrate Group: 3 Protein Group: 2 Vegetables Group: 3 Fat Group: 2 Fruit Group: 1
SNACK 2	<ul style="list-style-type: none"> <li>• <b>Carbohydrate group:</b> 3 cups of low salt popcorn</li> <li>• <b>Milk group:</b> ½ cup low fat milk, yogurt</li> </ul>	Carbohydrate Group: 1 Milk Group: ½
DINNER	<ul style="list-style-type: none"> <li>• <b>Carbohydrate group:</b> 2 whole grain (toast or ½ bread) or 1 cup whole grain breakfast cereal or oats 2/3 cup of rice or 2/3 cups macaroni or 2 small potatoes</li> <li>• <b>Protein group:</b> 30 g of chicken or fish without skin (grilled or cooked) or 2 table- spoons low fat labneh</li> <li>• <b>Vegetable group:</b> 1 cup fresh salad and 1 cup cooked vegetables</li> <li>• <b>Fat Group:</b> 1 Teaspoons vegetable oil for cooking or salad</li> </ul>	Carbohydrate Group: 2 Protein Group: 1 Milk Group: 1 Vegetables Group: 3 Fat Group: 1
SNACKS 3	<ul style="list-style-type: none"> <li>• <b>Fruit group:</b> 1 Fruit</li> <li>• <b>Milk group:</b> 1 low fat cup milk, yogurt</li> </ul>	Fruit Group: 1 Milk Group: 1

Diet plan

# 1,800 CALORIES

Choose one option from each group



MEAL	FOOD GROUPS	SERVING SIZE
BREAK FAST	<ul style="list-style-type: none"> <li>• <b>Carbohydrate Group:</b> 2 whole grain (toast or ½ bread) or 1 cup whole grain breakfast cereal or oats</li> <li>• <b>Protein Group:</b> 1 egg or 2 tablespoon cheese, 2 tablespoons low fat labneh</li> <li>• <b>Milk Group:</b> 1 cup low or skimmed fat milk, yogurt</li> <li>• <b>Vegetables Group:</b> 1 cup slices of tomato, cucumber and lettuce</li> <li>• <b>Fat Group:</b> 1 Teaspoon olive oil or 8 small olives or 6 almonds, or 2 tablespoon avocado or ½ table spoon peanut butter</li> </ul>	Carbohydrate Group: 2 Protein Group: 1 Milk Group: 1 Vegetables Group: 1 Fat Group: 1
SNACK 1	<ul style="list-style-type: none"> <li>• <b>Fruit group:</b> 1 medium size fruit (1 Apple or 1 orange or 1 guava or ½ banana or 2 tangerine or 12 grapes)</li> </ul>	Fruit Group: 1
LUNCH	<ul style="list-style-type: none"> <li>• <b>Carbohydrate Group:</b> 1 cup of rice or 1 cups macaroni or ¾ whole grain bread or 1 medium potatoes</li> <li>• <b>Protein Group:</b> 90 g chicken or fish without skin (grilled or cooked)</li> <li>• <b>Vegetables Group:</b> 1 cup fresh salad and 1 cup cooked vegetables</li> <li>• <b>Fat Group:</b> 2 Teaspoons vegetable oil for cooking or salad</li> <li>• <b>Fruit Group:</b> 1 medium size fruit</li> </ul>	Carbohydrate Group: 3 Protein Group: 3 Vegetables Group: 3 Fat Group: 2 Fruit Group: 1
SNACK 2	<ul style="list-style-type: none"> <li>• <b>Carbohydrate group:</b> 3 cups of low salt popcorn</li> <li>• <b>Milk group:</b> 1 cup low or skimmed fat milk, yogurt</li> </ul>	Carbohydrate Group: 1 Milk Group: 1
DINNER	<ul style="list-style-type: none"> <li>• <b>Carbohydrate group:</b> a slice of toast, samona, burger bread, medium-sized slice of bread (equivalent to 30 grams), cup of oats, ½ cup of mashed potatoes, or of any type of legumes</li> <li>• <b>Protein group:</b> 60 g of chicken or fish without skin (grilled or cooked) or 4 table-spoons low fat labneh</li> <li>• <b>Vegetable group:</b> 1 cup fresh salad and 1 cup cooked vegetables</li> <li>• <b>Fat Group:</b> 1 Teaspoons vegetable oil for cooking or salad</li> </ul>	Carbohydrate Group: 2 Protein Group: 1 Milk Group: 1 Vegetables Group: 1 Fat Group: 1
SNACKS 3	<ul style="list-style-type: none"> <li>• <b>Fruit group:</b> 1 Fruit</li> <li>• <b>Milk group:</b> 1 low or skimmed fat cup milk, yogurt</li> </ul>	Fruit Group: 1 Milk Group: 1

## REFERENCES

<https://www.heartuk.org.uk/cholesterol/what-is-cholesterol>  
<https://www.healthlinkbc.ca/health-topics/a1160619>

