

Cholesterol



What is cholesterol?

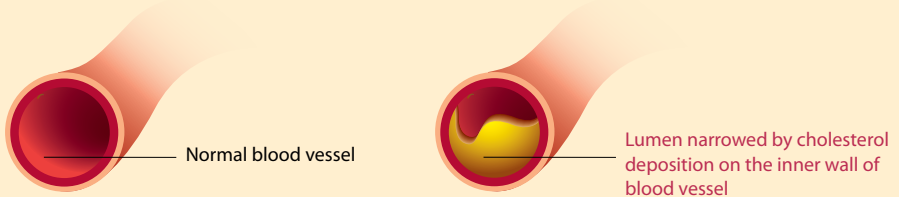
Cholesterol is a kind of fat and a major component of cell walls, bile and various hormones. Most of the cholesterol in our body is produced by the liver. We can also get cholesterol from animal sources such as meat, fish, seafood and dairy products. Since cholesterol is insoluble in the blood, it combines with a substance known as “lipoprotein” before it can travel to all parts of the body through blood circulation.

Body mechanism for regulating cholesterol

There is a mechanism in our body that keeps the blood cholesterol levels within the normal range. When we have a high consumption of cholesterol-rich foods, the liver will produce less cholesterol to prevent the levels from getting too high. If our diets are low in cholesterol, the liver will produce more of it to fulfil our body needs. For some individuals, this mechanism fails to work and their blood cholesterol levels elevate after frequent consumption of cholesterol-rich foods. Thus, these individuals have to manage their diets very carefully to prevent associated health risks.

Health effects of excessive cholesterol

Excess cholesterol in the blood may be deposited on the inner walls of blood vessels, leading to the narrowing or blockage of the lumen. Coronary heart disease occurs when the coronary artery that supplies blood to the heart muscles is blocked. Similarly, a stroke occurs when cholesterol deposition causes blockage or rupture of the blood vessels in the brain. In severe cases, this could lead to hemiplegia or even death. Currently, stroke and heart disease are the major killer diseases in Hong Kong.



Desirable levels of cholesterol and lipoproteins

“Total cholesterol” is the sum of all cholesterol in our blood. It mainly consists of “low density lipoprotein (LDL) cholesterol” and “high density lipoprotein (HDL) cholesterol”.

LDL cholesterol promotes fat deposition in blood vessels and increases the risk of coronary heart disease. For these reasons, it is commonly known as “bad cholesterol”. On the contrary, HDL cholesterol is called “good cholesterol” as it helps prevent blockage and rupture of blood vessels and reduces the risk of heart disease. Since the total cholesterol is a measurement of both good and bad cholesterol, an elevated level of total cholesterol is not desirable.

Blood tests can help us measure the levels of different types of cholesterol and assess the risk of coronary heart disease. Based on the statistics available, the desirable cholesterol levels are as follows:

Types of blood cholesterol	Desirable levels (mmol/L)
Total cholesterol	Below 5.2
LDL cholesterol	Below 3.4 (Below 2.6 is more desirable)
HDL cholesterol	Above 1.0 (1.6 or above is more desirable)

How to prevent cholesterol from becoming too high?

To prevent blood cholesterol levels from becoming too high and reduce the risk of coronary heart disease and stroke, it is very important to adopt a healthy diet and lifestyle.

Dietary advices:

1. Have a balanced and low-fat diet. The most important thing is to reduce the consumption of foods that are high in saturated and trans fats. Saturated fat is solid at room temperature and mainly comes from animal fats. It is also found in some plant-based fats. Saturated fat not only induces blood clotting, which in turn leads to illnesses such as arterial thickening, stroke and heart attack, but also prompts the liver to produce more cholesterol, causes an increase in the levels of bad cholesterol in the blood and is more harmful than an excessive intake of dietary cholesterol. Trans fat is formed when vegetable oils undergo the hydrogenation process. It increases the levels of bad cholesterol and reduces the levels of good cholesterol in the blood, thereby resulting in a higher risk of cardiovascular diseases.

Types of fat	Food sources
Animal-based saturated fat	Fatty meat, meat with skin, butter, lard, whole milk and its products (including cream and evaporated milk)
Plant-based saturated fat	Palm oil, coconut oil and coconut products (e.g. coconut milk and coconut shreds)
Trans fat	Hard margarine, shortening, as well as fried foods and bakery products that are made with margarine or shortening (e.g. biscuits, chips, cakes, salad dressing, pastries, non-dairy creamer and French fries)

2. Eat as little dietary cholesterol as possible.
 - At present, there is not enough evidence to suggest a limit on the consumption of dietary cholesterol. However, the World Health Organization recommends that people should eat as little dietary cholesterol as possible.
 - For healthy individuals, cholesterol-rich foods that are lower in fat such as eggs, squid, shrimp and crab should be counted towards the intake of “Meat, Fish, Egg and Alternatives” and consumed in moderation.
 - Patients with hyperlipidaemia or chronic diseases should consult healthcare professionals for individualised dietary recommendations.
3. Eat more foods that are rich in soluble dietary fibre such as vegetables, fruit, oatmeal and dry beans. Soluble fibre binds with cholesterol-like substances such as bile for excretion and helps lower the blood cholesterol levels.
4. Have a moderate consumption of unsaturated fat. Monounsaturated fat can reduce the levels of bad cholesterol and maintain healthy blood circulation. Meanwhile, polyunsaturated fat can reduce the levels of total cholesterol (including both bad and good cholesterol) in the blood.
 - Unsaturated fat is liquid at room temperature. It is usually found in vegetable oils. Some seeds, nuts and fruits also contain unsaturated fat.

Sources of unsaturated fat	Examples
Vegetable oils	Olive oil, canola oil, peanut oil and corn oil
Seeds	Sesame and pine seeds
Nuts	Walnuts and cashews
Fruits	Avocados

Healthy lifestyle:

1. Maintain an ideal body weight. For Asian adults, the normal range of body mass index (BMI) is between 18.5 and 22.9.*
2. Exercise regularly. Adults are recommended to do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week.
3. Do not smoke.
4. If you drink, follow your doctor's advice to quit drinking or limit your drinking to minimise alcohol-related harm.
5. Take cholesterol lowering medication timely and consistently if it is prescribed by your doctor as part of your treatment. Arrange follow-up appointments on a regular basis and avoid consuming high-fat foods.
6. Individuals with family history of heart or vascular diseases should pay extra attention to their diet. Regular medical examinations are highly recommended.

* The above BMI classification is promulgated by the Western Pacific Region Office of the World Health Organization for Asian adults' reference and is not applicable to children under the age of 18 or pregnant women.

Fat and cholesterol contents of common foods

On the basis of a 2000-kcal diet, the daily limit of fat intake for an adult is as follows:

- Total fat: 60 g
- Saturated fat: 20 g
- Trans fat: 2.2 g

Patients with hyperlipidaemia or chronic diseases should consult healthcare professionals for individualised dietary recommendations.

Common foods	Total fat (g)	Saturated fat (g)	Trans fat (g)	Cholesterol (mg)
Grains				
Macaroni (cooked, 1 bowl, 150g)	1.4	0.3	0	0
Rice (1 bowl, 200g)	0.4	0.1	/	0
Fruits & Vegetables				
Coconut meat (1 cup, shredded, 80g)	26.8	23.8	/	0
Avocado (1 cup, cubes, 150g)	22.0	3.2	/	0
Apple (1 medium, with skin, 180g)	0.7	0	/	0
Choy sum (raw, 100g)	0.3	0	/	0
Carrot (raw, 100g)	0.2	0	0	0
Eggs (Raw)				
Duck egg (1 egg, 70g)	9.6	2.6	/	619
Chicken egg (1 extra large egg, 56g)	5.6	1.7	/	237
Quail egg (1 egg, 9g)	1.0	0.3	/	76
Meat & Poultry (Raw)				
Pork kidneys (100g)	3.3	1.0	/	319
Pork liver (100g)	3.7	1.2	/	301
Pork, spare ribs, separable lean and fat (100g)	23.4	7.5	0.22	80
Pork belly (100g)	53.0	19.3	/	72
Pork chop, separable lean (100g)	6.5	2.2	/	55
Beef tripe (100g)	3.7	1.3	0.15	122
Beef rib, separable lean and fat (100g)	26.1	10.8	/	70
Beef brisket, separable lean (100g)	3.8	1.4	/	41
Lamb rib, separable lean and fat (100g)	24.2	11.9	/	68
Lamb leg, separable lean (100g)	5.2	2.1	/	64
Chicken wing, with skin (100g)	16.0	4.5	0.19	77
Chicken breast, with skin (100g)	9.3	2.7	0.10	64
Chicken breast, without skin (100g)	2.6	0.6	0.01	64

Common foods	Total fat (g)	Saturated fat (g)	Trans fat (g)	Cholesterol (mg)
Fish & Seafood (Raw)				
Squid (100g)	1.4	0.4	/	233
Cuttlefish (100g)	0.7	0.1	/	112
Shrimp (100g)	1.7	0.3	/	152
Crab (100g)	1.1	0.2	/	78
Clam (100g)	1.0	0.1	/	34
Scallop (100g)	0.8	0.1	/	33
Grouper (100g)	1.0	0.2	/	37
Dairy Products				
Whipping cream (29g)	10.4	6.7	0.23	32
Cheddar cheese (28g)	9.3	5.9	/	29
Cottage cheese (28g)	1.2	0.5	/	5
Canned evaporated milk (31.5g)	2.4	1.5	/	9
Whole milk (1 cup, 257g)	9.5	4.6	0.23	36
Skimmed milk (1 cup, 245g)	0.2	0.1	/	5
Fats & Oils				
Butter (100g)	81.1	51.4	/	215
Lard (100g)	100.0	38.0	0.75	95
Soft margarine (100g)	75.0	17.0	1.50	5
Hard margarine (100g)	80.0	14.0	11.0	1
Coconut oil (100g)	100.0	86.5	/	0
Vegetable oils (100g) (e.g. peanut oil, corn oil, olive oil)	100.0	14.4	/	0
Chinese Dim Sum				
Barbecued pork puff pastry (1 piece, 39g)	11.3	3.9	0.08	32
Mini-sized sticky rice wrapped in lotus leaf (1 piece, 96g)	7.0	2.3	/	27
Siu mai (1 piece, 29g)	3.8	1.1	/	22
Spring roll (1 piece, 35g)	7.4	1.3	0.03	12
Steamed beef ball with bean curd sheet (1 piece, 49g)	6.9	1.4	/	11
Steamed barbecued pork bun (1 piece, 55g)	4.0	1.0	/	9
Deep-fried meat dumpling (1 piece, 45g)	7.2	2.0	0.02	7
Pan-fried turnip cake (1 piece, 84g)	4.8	0.8	/	7
Cakes, Pastries & Breads				
Cheese cake (1 piece, 126g)	23.9	15.1	0.57	164
Chiffon cake (1 piece, 77g)	13.1	3.5	/	146
Assorted cake (1 piece, 76g)	13.7	6.8	0.30	76
Muffin (1 piece, 81g)	15.4	5.3	0.24	68
Egg tart (1 piece, 70g)	11.9	4.3	/	65
Curry puff (1 piece, 70g)	18.2	8.4	0.64	47
Sausage bun (1 piece, 96g)	12.5	3.6	0.04	43
Pineapple bun (1 piece, 97g)	12.6	4.7	0.07	26
Cocktail bun (1 piece, 103g)	19.6	9.1	0.42	28
Wheat bread (1 slice, 47g)	2.4	0.8	/	4

/ means that relevant nutrient data for that particular food item is not available.

Source: Centre for Food Safety

For more health information, please call Health Education Infoline of the Department of Health on **2833 0111** or visit the website of the Centre for Health Protection, Department of Health at **www.chp.gov.hk**



Centre for Health Protection Website



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