



So you have high cholesterol, now what?

- Most people would immediately start cutting down on foods that have a high cholesterol content, but restricting cholesterol intake alone is not enough to lower blood cholesterol levels. A truly effective cholesterol lowering diet is one where TOTAL FAT is restricted, has the right balance of the three different types of fat namely, *saturated, poly-unsaturated and mono-unsaturated* fat, is high in soluble fibre and also includes adequate amounts of certain vitamins.

To reduce total fat intake:

- use foods that have a low fat content where possible - not more than 30% of the total kilojoules coming from fat (to calculate this, multiply the grams of fat by 38 and divide by the total kilojoules. Multiply by 100 to get to %).
- limit the use of concentrated fats such as oil and margarine - try not to fry food, rather grill, bake, steam, poach, microwave or boil.

Saturated fat increases blood cholesterol levels to a far greater extent than the actual cholesterol content of foods. It is therefore recommended that less than one third of your total daily fat intake should be saturated fat, more or less one third poly-unsaturated fat and the rest mono-unsaturated fat. The easiest way of doing this is to include food from the saturated fat group at only ONE of the daily meals i.e. EITHER breakfast OR lunch OR supper (see example).

	Saturated fat	Poly-unsaturated	Mono-unsaturated
Animal origin	Red meat, pork, bacon, processed meat, organ meat, poultry, full cream and low fat milk and yoghurt, cream, cheese, butter, hard margarine, lard, suet, eggs.	Fish and fish oils.	
Plant origin	Coconut, coconut oil, palm kernel oil.	Sunflower and sesame seeds, vegetable oils eg. sunflower oil, soya bean oil, maize oil.	Avocado, olives, olive oil, canola oil, nuts, peanuts.
Other	Hardened or hydrogenated vegetable oils eg. vegetable fat, hardened or hydrogenated margarine/fish oils, biscuits, cakes, pie, crust, tarts, pastries, chocolate, coffee creamers, milk or dairy solids, ice cream, non-dairy cream substitutes, shortening.	Salad dressing made with sunflower oil, soft poly-unsaturated margarine.	Olive oil margarine, canola margarine, peanut butter.

	Example menu 1	Example menu 2	Example menu 3
Breakfast	Bran-rich cereal with skim milk and sliced banana.	Oats with skim milk. Paw-paw.	Bran muffin with canola margarine and jam. Fat free yoghurt.
Mid-morning	Nectarine.	Orange.	Mango.
Lunch	Bread roll with avocado, tomato and lettuce.	Peanut butter sandwich.	Low fat cheese and tomato sandwich on rye bread.
Mid-afternoon	Strawberries.	Apples.	Grapes.
Supper	Beef lasagne (lean mince, added oat bran, skim milk, low fat cheese). Pumpkin and broccoli.	Grilled skinless chicken. Samp and dried beans. Cabbage salad with low oil mayonnaise (egg free).	Grilled sole, baked potato with fat free cream cheese. Carrot and pineapple salad. Creamed spinach (white sauce made with skim milk).

Other ways of lowering saturated fat intake:

Eat small portions of meat and chicken, filling up on grains and vegetables; remove visible fat from meat and skin from chicken before cooking; eat fish more often than red meat or chicken; eat avocado on bread rather than cheese; use fat free rather than full cream or even low fat dairy products; check food labels for ingredients containing saturated fat.

Fabulous fibre:

Soluble and insoluble fibre are not equally beneficial in reducing cholesterol levels. Soluble fibre lowers blood cholesterol levels and helps to reduce the body's production of cholesterol. Try to eat more soluble fibre-rich foods such as: oats, oat bran, dried peas, beans and lentils, wheat bran, rye, barley, fruit and vegetables especially apples, citrus fruit, carrots and strawberries (see example menu).

Vital vitamins:

Certain vitamins play an important role in reducing the risk of heart disease. These vitamins, called anti-oxidant vitamins (vitamin C, E and Beta-carotene), reduce fatty build up in the arteries. Eat more vitamin C-rich foods such as citrus fruits, tomatoes, strawberries, cabbage, red and green pepper, guavas, brussel sprouts, broccoli and sweet potato, sweet melon, kiwi fruit.

Beta-carotene-rich foods: mangoes, dried peaches and apricots, spanspek, nectarines, carrots, sweet potato, spinach and broccoli.

Vitamin E-rich foods: wheat germ, sunflower seeds and oil, soya bean oil, soya beans, canola and soft margarine, maize, maize oil, toasted almonds and hazel nuts.

	Eat most often	Eat in moderation	Eat minimal
Meat and meat alternatives	Fish, soya.	Lean red meat, skinless poultry, lean bacon, game.	Fatty cuts of meats, processed meat, sausages, organ meat, shellfish, beef biltong.
Dairy products and egg	Skim or fat free milk, fat free yoghurt, fat free or low fat cottage cheese, fat free cream cheese, egg whites.	Low fat milk, low fat yoghurt, low fat buttermilk, low fat evaporated milk, low fat cheese (less than 15g fat per 100g), low fat processed cheese, creamed cottage cheese, sorbet.	Full cream milk, full cream yoghurt, condensed milk, cream and cream substitutes, coffee creamers, dairy blends, cream cheese, high fat cheese, ice cream, egg yolks.
Fruit and vegetables	Fresh, frozen or tinned vegetables, fresh or dried fruit, fruit tinned in natural juices.	Glazed fruit and fruit tinned in syrup.	Vegetables prepared in butter or cream sauces.
Starches	Pasta, rice, potatoes, mealies, samp, pearl wheat, mealie rice, sweet potato, whole-wheat, brown and rye bread, high fibre breakfast cereals, oats, mealie meal, low fat wholewheat crackers, rye crackers, rice cakes, air popped-popcorn, dried peas, beans, lentils.	Low fat refined crackers eg. matzo, white bread, home-made baked products using unsaturated oils sparingly and no egg yolk, eg. muffins, refined breakfast cereal.	Commercially baked products eg. pies, pastry, cakes, tarts, croissants, doughnuts, high fat refined biscuits or crackers, buttered or commercial popcorn, muesli with coconut.

Vital vitamins - continue:

	Eat most often	Eat in moderation	Eat minimal
Fats and oils		Unsaturated oils, eg. sunflower, canola, maize, soya, olive oil, soft margarine, low oil mayonnaise and salad dressing, olives, avocado, seeds eg. sunflower, sesame, nuts, eg. pecan, cashew, peanut butter.	Palm kernel oil, coconut oil, coconut, coconut milk, lard, suet, cocoa butter, butter, hard margarine, mayonnaise.
Miscellaneous	Tea.	Coffee, sugar, pretzels.	French fries, crisps, chocolate sweets, cream soups, alcohol.

Elevated cholesterol:

What is cholesterol?

Cholesterol is a waxy, fat-like substance (lipid). Although we are often warned of the dangers of cholesterol, we can't survive without it. It is essential to the body's cell membranes, to the insulation of nerves and to the production of certain hormones. It is also used by the liver to make bile acids, which help digest your food.



High blood cholesterol is a “risk factor” for heart disease. That means that having high blood cholesterol increases your chance (risk) of getting heart disease. The higher your cholesterol level, the greater your chances of dying of cardiovascular disease. You can lower your risk of cardiovascular disease by lowering your cholesterol level.

Good and bad cholesterol

Two specific kinds of blood cholesterol are called low density lipoproteins (LDL) and high density lipoproteins (HDL). LDL-cholesterol, sometimes called “bad” cholesterol, causes cholesterol to build up in the walls of arteries. Thus, the more LDL in the blood, the greater the heart disease risk. In contrast, HDL-cholesterol, or “good” cholesterol, helps the body get rid of the cholesterol in the blood. Thus, if levels of HDL are high, the risk of heart disease decreases.

Atherosclerosis

Atherosclerosis is a silent, painless process in which cholesterol-containing fatty deposits (plaques) accumulate on the walls of arteries. Cholesterol plays a significant role in the development of narrowed or blocked arteries. Reduced flow to the coronary (heart) arteries, can lead to chest pain (angina pectoris). If the flow of blood to a part of the heart is stopped, you’ll have a heart attack. If blood flow to a part of your brain stops, you’ll have a stroke.

What causes elevated cholesterol levels?

High cholesterol levels may result from many causes, such as genetic make-up, various disease states, lifestyle choices, medications or the excessive dietary intake of cholesterol and saturated fat. These increase your risk for atherosclerosis. Disease of the kidney, liver, endocrine and immune systems, as well as stress-related conditions, are associated with lipid abnormalities. Certain medications may cause abnormal lipid levels. Both heredity and diet have a significant influence on one’s LDL, HDL and total cholesterol levels.

One in every 500 adults has an inherited abnormality in processing of LDL cholesterol. These patients have elevated blood cholesterol even with a diet of only average fat intake.

Diets high in cholesterol and saturated fats can increase blood cholesterol levels. Saturated fats are derived primarily from meat and dairy products and can raise blood cholesterol levels.

Unsaturated fats do not raise blood cholesterol and can sometimes even lower cholesterol.

Cholesterol tests

All adults over 20 years of age should have a non-fasting total cholesterol and HDL measured at least once every three (3) to five (5) years. If the total cholesterol and HDL are abnormal, a lipoprotein analysis, which measures fasting total cholesterol, HDL, LDL and triglycerides, is recommended.

If an underlying disease or medication is responsible for the abnormal cholesterol levels, this process should be corrected.

Cholesterol levels may vary slightly due to biological variation, thus, if your levels are abnormal, two measurements should be taken, one to eight (8) weeks apart, and the values averaged to obtain an accurate baseline level.

Treatment of elevated cholesterol

Treatment decisions are based on two criteria:

1. The lipid (cholesterol) profile.
2. Cardiovascular risk factors.

Cholesterol profile (mmol/l)

- It total cholesterol is less than 5.0 mmol/l and HDL above 0.9 mmol/l, no treatment is needed, but you should still follow a prudent diet and have your total cholesterol and HDL checked every five (5) years.
- Treatment for moderate cholesterol profiles and LDL cholesterol levels greater than 3.0 mmol/l, includes reducing dietary fat and cholesterol, stopping cigarette smoking, regular exercise and weight loss.
- Cholesterol-lowering medications are recommended for those with very high LDL cholesterol (greater than 5.0 mmol/l). These medications are also recommended for those with LDL cholesterol greater than 3.0 mmol/l and two or more coronary heart disease risk factors.

Treatment of elevated cholesterol - continue

- For patients with either angina or a prior heart attack, a more aggressive approach to prevent future heart attacks is recommended. Total blood and LDL cholesterol in these patients is treated at lower levels. Diet and exercise are recommended if the LDL is below 3.0 mmol/l, while drug therapy is recommended for LDL above 3.0 mmol/l. The treatment goal is and LDL of less than 3.0 mmol/l, or a reduction in LDL of at least 45% in severe cases of individuals who do not reach this level.

Cardiovascular risk factors

You must consider other risk factors for cardiovascular disease when evaluating your cholesterol status. Each risk factor may influence your lipid levels. The more risk factors you have, in combination with undesirable lipid levels, the greater your risk of developing cardiovascular disease. Risk factors for cardiovascular disease are divided into those you can change and those you can’t.

Factors you can do something about include cigarette smoking, high total and LDL cholesterol, low HDL cholesterol, high blood pressure, diabetes, obesity / overweight and physical inactivity.

Factors you cannot control include age, male gender or family history of heart attack or sudden death.

Lifestyle guidelines

There are many lifestyle changes that can decrease blood cholesterol, notably eating a diet low in saturated fat, total fat and cholesterol, and increasing the intake of fruits, vegetables, fish, whole grains and lean meat. Physical exercise, losing weight and stopping smoking are also important. Adopting good lifestyle habits won’t only decrease your risk of disease from raised cholesterol, they can also help control high blood pressure as well as diabetes.

To be successful in controlling your cholesterol levels, you need to be committed to change your lifestyle and diet. If you are on medication, you should never stop taking it without checking with your doctor.

South Africa has one of the highest incidences of raised cholesterol and related diseases in the world. It is important that you remain well informed on your cholesterol levels and take action toward a healthier, more energetic lifestyle.