Nutritious & Delicious

HEALTH MATTERS!

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Cholesterol

Cholesterol is a fatty substance known as a lipid and is vital for the normal functioning of the body. It's mainly made by the liver, but can also be found in certain foods.
Having an excessively high level of lipids in your blood (hyperlipidaemia) can have an effect on your health. High cholesterol itself doesn't usually cause any symptoms, but it increases your risk of serious health conditions.

About cholesterol

Cholesterol is carried in your blood by proteins, and when the two combine they're called lipoproteins. The two main types of lipoprotein are:
High-density lipoprotein (HDL) – which carries cholesterol away from the cells and back to the liver, where it's either broken down or passed out of the body as a waste product. For this reason, HDL is referred to as "good cholesterol" and higher levels are better. It is a small, highly dense compact molecule.

Low-density lipoprotein (LDL) – which carries cholesterol to the cells that need it. If there's too much cholesterol for the cells to use, it can build up in the artery walls, leading to disease of the arteries. For this reason, LDL is known as "bad cholesterol". It is a large (low density) molecule – its size also causes it to build up in the arteries.

The amount of cholesterol in the blood (both HDL and LDL) can be measured with a blood test. The recommended levels of cholesterol in the blood vary between those with a higher or lower risk of developing arterial disease.

UK Reference Ranges

- **Total cholesterol** less than or equal to **5mmol/L**
- **Cholesterol:HDL** ratio less than or equal to **4**
- **LDL cholesterol** less than or equal to **3mmol/L**
- **HDL cholesterol** greater than or equal to **1mmol/L**

Why should I lower my cholesterol?

Evidence strongly indicates that high cholesterol can increase the risk of:

- Narrowing of the arteries (atherosclerosis)
- Heart Attack
- Stroke
- Transient Ischaemic Attack (TIA) – often known as a "mini stroke"
- Peripheral Arterial Disease (PAD)

This is because cholesterol can build up in the artery wall, restricting the blood flow to your heart, brain and the rest of your body. It also increases the risk of a blood clot developing somewhere in your body.
Your risk of developing coronary heart disease also rises as your blood's cholesterol level increases. This can cause pain in your chest or arm (angina) during stress or physical activity.

What causes high cholesterol?

Many factors increase your chances of having heart problems or a stroke if you have high cholesterol:
An unhealthy diet – some foods, such as eggs and prawns, contain cholesterol ("dietary cholesterol"), but this has little effect on blood cholesterol. It's the total amount of saturated fat in your diet that's more important to watch.
Lack of exercise or physical activity – this can increase your level of "bad LDL cholesterol".
Obesity – if you're overweight, it's likely that you'll have higher levels of LDL cholesterol and triglycerides, and a lower HDL.
Drinking excessive amounts of alcohol – regularly can increase your cholesterol and triglyceride levels.
Smoking – a chemical found in cigarettes called acrolein stops HDL transporting cholesterol from fatty deposits to the liver, leading to narrowing of the arteries (atherosclerosis)
Having diabetes or high blood pressure (hypertension)
Having a family history of stroke or heart disease
There is also an inherited condition called familial hypercholesterolemia, which can cause high cholesterol even in someone who eats healthily.

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Foods And Lifestyle Changes To Help Lower Cholesterol

Foods to Eat

- **Vitamin E - avocadoes, nuts & seeds, peppers, olive oil, tomatoes, wheat germ, tahini**: vitamin E prevents oxidation of LDL, prevents accumulation in cells and is a mild anti-clotting agent. It works with vitamin C in green vegetables and fruit and carotenoids in red, yellow and orange foods in the antioxidant cycle.
- **Fibre - oats, vegetables, fruit, wholegrains, beans & pulses**: helps to lower post-meal glucose levels, insulin levels, LDL and blood pressure.
- **B Vitamins - green leafy veg, bananas, beansprouts, mushrooms, lean meat:** decreased B vitamins means elevated homocystiene levels, which can damage arteries, and increases clotting factors and cholesterol.
- **Tomatoes -** contain the antioxidant **lycopene** (higher in lightly cooked tomatoes than raw) lowers LDL. Over 20mg of lycopene is associated with positive effects on the heart.
- **Garlic -** contains sulphur compounds that support the liver to produce bile, aiding the breakdown cholesterol.
- **Oily Fish - sardines, mackerel, anchovies, salmon, herring, trout and fresh tuna** contain essential fatty acids [omega 3 fish oils] (EFAs – EPA & DHA), which can help to lower cholesterol and triglyceride levels, reduce inflammation of the arteries and reduce platelet aggregation.
- **Antioxidants -** carotenoids and flavonoids in brightly coloured vegetables and fruit, especially from red, orange and yellow protect against free radical damage and oxidization. Try to eat **at least five portions of varied types per day.**
- **Minerals -** manganese, zinc and copper are necessary for the anti-oxidant enzymes to function. Found in wholegrains, seeds, nuts and legumes.
- **Cooking Oils** - olive (not virgin) & especially coconut oils and duck fat are less susceptible than other oils to lipid peroxidation (damage). Heat changes the chemical structure of polyunsaturated fats turning them toxic.
- **Eggs -** egg yolks contain high levels of dietary cholesterol, but are not responsible for high cholesterol levels. Limit to 9-12/week (not fried) if cholesterol is already high. Eggs are good source of protein and Vitamins A and B.
- **Exercise -** boosts the body to produce more antioxidant enzymes, protecting against oxidative damage. Increases HDL cholesterol, which helps to remove LDL from the artery walls. Aim for resting HR of 60-75 bpm.

Foods to Limit

- **Saturated fat (See Causes) -** Reduce or eliminate animal fats and vegetable sources of saturated fats.
- **Trans and Hydrogenated Fats -** Eliminate ALL foods containing these fats e.g. margarine, biscuits, processed foods etc., as they raise LDL and lower HDL levels and interfere with Omega 3 fat metabolism.
- **Sugar and refined carbohydrates -** Elevated insulin levels as a result of eating sugar-raising foods are associated with increased cholesterol – avoid sugary foods and drinks with added sugar.
- **Alcohol (See Causes).**

Supplements That May Help Lower High Cholesterol Levels

- **Omega-3 fish oil capsules 1-2g per day:** PUFAs in fish oil reduce inflammation in arteries, reduce LDL and triglyceride levels, and inhibit clotting, reducing risk of thrombosis. Usually contain small amount of Vitamin E so no need to supplement with more.
- **Coenzyme Q10 100-300mg per day:** prevents LDL cholesterol from oxidising. Should be taken if currently taking statin medication - which slow down body's ability to make Q10.
- **Vitamin c 1-3g per day:** lowers LDL by reducing levels of clotting factors in the blood and helps to transform cholesterol into bile acids for excretion, and also helps to strengthen capillaries and arteries. Needed for antioxidant cycle.
- **Plant sterols 1-2g per day:** impairs the uptake of cholesterol from the gut. Reduce total and LDL cholesterol. Better taken in a full esterified or emulsion form for better bioavailability.

Please Note: This handout should only be used as a guide to help inform you as to the foods that **may** help to lower cholesterol. It **should not** be used as definitive guide to lowering cholesterol.