

Supporting Cholesterol Reduction through Diet and Lifestyle

An elevated blood cholesterol level is associated with the development of atherosclerosis (hardening of the arteries) and furthermore, cardiovascular disease (**CVD**).

Hyperlipidemia (elevated blood lipids) can be caused by factors such as:
*genetics *diet (especially one high in saturated fat, trans-fats and refined high glyceamic carbohydrates)
*excess kilojoule intake *excess body fat *lack of exercise *high stress,
*diabetes or insulin resistance and *menopause. **Accumulative, these factors heighten the risk of CVD.**

Dietary and lifestyle factors can play a large role in disease progression and prevention.

Cholesterol is produced by the body endogenously and needed for vital bodily functions including hormone and bile synthesis. It is the type of cholesterol, the ratios of these cholesterols and the total blood triglyceride levels that determine associated risk factors and the need for intervention.

When transported in the blood, cholesterol is attached to lipoproteins:

- **LDL cholesterol** (low-density lipoproteins) deposits cholesterol into the arteries and is associated with increased risks of heart disease, stroke and high blood pressure, by contributing to arterial plaque formation. Increased LDL is due to increased synthesis and or/reduced cholesterol clearance.
- **HDL cholesterol** (high-density lipoproteins) removes cholesterol from the arteries having a **protective** effect against heart disease, stimulating the liver to improve cholesterol excretion.

The Heart Foundation recommends the following goal for blood lipids (mmol/L):

- LDL:	below 2.5
- HDL:	above 1.0
- Triglycerides (TG):	below 1.5
- Total cholesterol:	below 4.0

Associated with reduced risk (mmol/L):

- * HDL: more than 1.0
- * Ratio HDL/total cholesterol: (0.23-0.29)

Blood cholesterol levels are determined predominantly by our own cholesterol production and not by dietary cholesterol. The amount we make is influenced by genetics and the amount of saturated fat we eat. Dietary cholesterol when eaten in conjunction with saturated fat will increase blood cholesterol levels.

DIETARY & LIFESTYLE RECOMMENDATIONS

AVOID / LIMIT / REDUCE...

- Saturated fats

Such as: all animal fats (bacon, sausages, chicken skin, pressed ham, salami, strassburg, butter, full cream milk, cream cheese, frozen yogurt), cake, biscuits, chips, muesli bars, chips, coconut, palm oil, fried food and processed 'convenient' foods, sausage rolls, pies, pasties

- Trans fats: these fats occur naturally in animal products and also in solidified or hydrogenated oils. They are produced in the processing of margarines.
Avoid: fatty animal products, margarine, deep fried foods

- Added sugars, alcohol, refined high glyceamic index (GI) carbohydrates, which are converted to triglycerides and stored as fat when consumed in excess

- Coffee intake (both caffeinated and decaffeinated)

- Cigarette Smoking

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INCREASE / INCLUDE / ENJOY....

Fibre rich plant foods

Absorbs excess cholesterol for elimination, reducing LDL cholesterol and assists bowel function

Sources include: vegetables, fruit, legumes, soy beans, raw nuts, seeds and grains such as oats, oat bran, rice bran, psyllium husks, soaked linseeds (try with yogurt & berries), slippery elm (try with milk & banana)

Always combine supplemental fibre with an adequate water intake

- Omega 3 fatty acids and EPA/DHA rich fish oils

Work to lower triglycerides, increase HDL cholesterol and prevent blood clot formation

Oily fish including Atlantic salmon, gemfish, Spanish mackerel, tuna and sardines are good sources of omega 3 fatty acids.

Aim for 4 servings of fish per week
Walnuts, linseeds (flaxseed oil) and leafy vegetables are also sources of omega 3

- Bitter foods and drinks

Stimulate liver activity, increasing bile production. **Cholesterol elimination via the bile is improved by bile acids and HDL**

*Bitter greens include: rocket, radicchio (try mixing with spinach, crushed **garlic** and olive oil) lemon juice, apple cider vinegar (before meals)*

Reduce weight to within a healthy range; especially abdominal weight.

Regular exercise (for 30 minutes, most days of the week) increases HDL cholesterol, relieves stress and improves mood.

- **Garlic** aids cholesterol reduction, improves blood triglyceride ratios and limits free radical damage

- Antioxidants (vitamin E and vitamin C)

These aid the reduction of total blood cholesterol levels and the free radical damage of oxidised LDL cholesterol; increasing HDL cholesterol

*Good sources of **Vitamin E** include: wheatgerm, sunflower seeds, wholegrain cereals, eggs, avocado, brocolli and leafy greens*

*Good sources of **Vitamin C** include: citrus fruits, blackcurrants, red peppers, kiwi fruits, kale*

Choline and Lecithin (soy or egg)

Reduces cholesterol by helping to remove cholesterol from the tissues

Choline is found in green leafy vegetables, where sources of choline in the form of lecithin include: eggs, lean meat, brewer's yeast, legumes including soy beans, grains and nuts

- **Water (aim for 30 ml per kg of body weight + 500ml extra if exercising)**

- **Regular aerobic exercise**

Note: these suggested dietary and lifestyle recommendations should be used in conjunction with therapeutic interventions