

"Cholesterol, cardiovascular disease & medical myths"

by Tessa Jupp RN from a lecture 6 Aug 2011 to OSWA by Assoc Prof Peter Dingle PhD and his book "The Great Cholesterol Deception" published 2011 and from the Dingle website www.drDingle.com

What is Cholesterol?

I found 2 good simple explanations to this question - the first by **Barry Groves PhD**:

"Cholesterol is an essential component in the body. It is found in all the cells of the body, particularly in the brain and nerve cells. Body cells are continually dying and new ones being made. Cholesterol is a major building block from which cell walls are made. Cholesterol is also used to make a number of other important substances: hormones (including the sex hormones), bile acids and, in conjunction with sunlight on the skin, vitamin D3. The body uses large quantities of cholesterol every day and the substance is so important that, with the exception of brain cells, **every body cell has the ability to make it.**

Cholesterol may be ingested in animal products, but less than 20% of your body's cholesterol needs will be supplied in this way. Your body then makes up the difference. If you eat less cholesterol, your body merely compensates by making more. Although the media and food companies still warn against cholesterol in diet, it has been repeatedly demonstrated that **the level of cholesterol in your blood is affected very little by the amount of cholesterol you eat.**"

And the second by **Uffe Ravnskov, MD PhD**

"Cholesterol is a peculiar molecule. It is often called a lipid or a fat. However, the chemical term for a molecule such as cholesterol is alcohol, although it doesn't behave like alcohol. Its numerous carbon and hydrogen atoms are put together in an intricate three dimensional network, impossible to dissolve in water. **All living creatures** use this indissolvability cleverly, **incorporating cholesterol into their cell walls to make cells waterproof.** This means that cells of living creatures can regulate their internal environment undisturbed by changes in their surroundings, a mechanism vital for proper function. The fact that cells are **waterproof is especially critical for the normal functioning of nerves and nerve cells.** Thus, **the highest concentration of cholesterol in the body is found in the brain and other parts of the nervous system.**

Because cholesterol is insoluble in water and thus also in blood, it is transported in our blood inside spherical particles composed of fats (lipids) and proteins, the so-called lipoproteins. Lipoproteins are easily dissolved in water because their outside is composed mainly of water-soluble proteins.

The inside of the lipoproteins is composed of lipids, and here are room for water-insoluble molecules such as cholesterol. Like submarines lipoproteins carry cholesterol from one place in the body to another."

Peter Dingle says:

Cholesterol is a member of the large family of chemical compounds known as lipids (fats). However, cholesterol is a separate, specialised type of lipid that is chemically different from fat. Cholesterol is a part of the subgroup "sterols", whereas dietary and body fat are a part of the subgroup "glyceryl esters". There are two main categories of cholesterol. **Dietary cholesterol comes from the animal-based food we consume and cannot be measured by the doctor.** The other type of cholesterol is **blood cholesterol, which is made in the liver.** Although the two types are chemically identical, they are not representative of each other. **The cholesterol levels measured at the doctor's office and in most studies are blood cholesterol levels and are representative of liver function.**

High cholesterol is a symptom of an underlying health problem. It predicts less than 35% of CVD (cardiovascular disease). In fact, most heart attack and stroke events occur in individuals without elevated cholesterol and 20% occur in people without any traditional risk factors. **Cholesterol is the messenger . telling us there is stress on the liver;** it delivers the news **but is not the killer it is made out to be.**

A significantly **better predictor is** the concentration of **Omega 3** oils in the blood: the higher the concentrations the lower the risk, with Omega 3 concentrations predicting up to 95% of CVD, compared to 35% prediction rates from cholesterol readings.

Another marker of inflammation in the body and a major risk factor for heart disease is C-reactive protein (CRP), a better predictor of CVD than cholesterol. However, it is just a marker and is not the cause of CVD.

Along with other signalling molecules, **insulin controls the production of fats such as cholesterol** and triglycerides. It also controls the packaging of cholesterol and triglycerides into LDL (low-density lipoproteins), VLDL (very low-density lipoproteins), HDL (high-density lipoproteins) and other lipoproteins.

Glucagon (a hormone secreted by the pancreas) inhibits the enzyme and insulin activates the enzyme. To control cholesterol production, you want to increase glucagon and decrease insulin. **When we eat sugar or processed carbohydrates such as white bread and breakfast cereals, we produce**



more insulin hormone, which stimulates more HMG-CoA reductase enzyme and, as a consequence, **more cholesterol** and triglycerides are **produced**. Simple carbohydrates are the main culprits [not fatty foods]. We have known this since the early 1970s. People with Type 2 diabetes have elevated fasting insulin as well as elevated cholesterol. In fact, elevated fasting insulin is a better predictor of cardiovascular disease than cholesterol. Glucagon, when present in the bloodstream, lowers insulin levels. Glucagon is released every time you eat lean protein [ie meats]. There is also strong evidence that **stress increases** a person's inflammatory markers and **cholesterol**.

One possibility may be that stress encourages the body to produce more energy in the form of metabolic fuels - fatty acids and glucose. These substances require the liver to produce and secrete more LDL, which is the principal carrier of cholesterol in the blood. Both **adrenaline and cortisol trigger the production of cholesterol**. Cortisol also has the effect of releasing sugar into the blood. To highlight the importance of this, we also know there is a strong association between stress and cardiovascular disease.

Not only is **cholesterol not the enemy**, but also **it is essential to good health and wellbeing**. Every cell in the body needs cholesterol in its membrane, where cholesterol plays a critical role in cell communication. **Without cholesterol, cell membranes are incomplete** and, as a result, **their functional role deteriorates**. Cholesterol is also used in the mitochondria of the cell and plays a **vital role in cell energy production** - not to mention its **essential role in the brain** structure and function.

Cholesterol is the **starting material** of many essential chemicals including **vitamin D**, steroid hormones and the bile acids necessary for digestion.

Cholesterol is metabolised into vital body steroids such as the steroid hormones, including: sex hormones oestrogen, progesterone, testosterone and DHEA, as well as the adrenal hormones aldosterone and cortisol. None of these can be made without cholesterol and their production changes along with the levels of cholesterol in the blood. Low levels of these hormones can have a significant impact on an individual's health and, in fact, low testosterone is associated with an elevated risk of all-cause mortality, as well as other chronic illnesses such as insulin resistance."

Correlation of Vitamin D and Cholesterol

"Numerous studies have shown that vitamin D deficiency is strongly associated with an increased risk in developing cardiovascular disease. Epidemiological studies report that the rates of coronary heart disease, higher rates of diabetes, hypertension and elevated LDL cholesterol, are strongly correlated with decreased vitamin D status. **Vitamin D** appears to be **necessary to** maintain adequate apolipoprotein A-I concentrations, the main component of **HDL (good) cholesterol**.

Vitamin D deficiency increases the risk of "all-cause mortality" and is associated with a 122% increase in the risk of "cardiovascular mortality" compared to the highest average Vitamin D levels. Researchers also found that low levels were linked to higher levels of inflammation markers, such as C-reactive protein (CRP) and interleukin-6 (IL-6), which are important markers for chronic illnesses, including cardiovascular disease (These **inflammation markers are a much better predictor of cardiovascular disease than cholesterol levels**).

Low vitamin D levels are linked with the formation of atherosclerosis. When researchers exposed macrophage cells (white blood cells) with and without vitamin D, they found that **vitamin D inhibits the uptake of cholesterol** by the macrophage cells. When people are deficient in vitamin D, the macrophage cells take in more cholesterol, and they can't get rid of it. The macrophages get clogged with cholesterol and become foam cells, which are one of the earliest markers of atherosclerosis. Macrophage activation is higher in people with diseases such as diabetes, and when found in combination **with low vitamin D** levels, the **macrophages become loaded with cholesterol** and eventually **stiffen blood vessels** and block blood flow.

Vitamin D appears to be necessary to maintain adequate apolipoprotein A-I concentrations, the main component of HDL (good) cholesterol reduction in coronary heart disease risk."

STATIN DRUGS NOT THE ANSWER

It is not cholesterol levels that harm us but excessive inflammation and oxidation. **The problem is lifestyle and diet that we need to fix**. Avoid processed grains and sugary foods, eat fruit and veg, nuts, fish and fish oils, avoid stress, stop smoking, start exercising, eat lean protein, increase deficient nutrients, particularly Vit C, Vit D, lycopene in red fruit and veg, and niacin.

SIDE EFFECTS of STATIN DRUGS	
Increased	Decreased
irreversible muscle loss/ CK	Vitamin D3 levels
fatigue/ amnesia/ forgetfulness	memory
Diabetes/ stroke risk	nerve function
cancer/ infections	Co-Q10 levels
depression/ suicide	energy levels
aggressive behaviour	immune function
liver and kidney damage	hormone production