



# Tibb Position Statement: Cholesterol and heart disease

Dr John Glynn and Prof Rashid Bhikha

Feb 2017

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## Abstract

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Fifty or so years ago, hardly anyone had heard about cholesterol, unaware that it is absolutely essential for the smooth running of our body, and how it plays a prominent role in our state of health and disease. Today, the issue of cholesterol and its relationship to dietary fats, heart disease and drug therapy is mired in fierce controversy. High blood cholesterol levels are viewed as a major threat to health, and we are advised to drive them down by diet changes or by using cholesterol-lowering drugs, especially the statins. Tibb has a different perspective to conventional medicine. It regards abnormally high blood cholesterol resulting from excessive or abnormal melancholic humour. This arises in most cases due to a dysfunctional diet and lifestyle and poor personal habits, and the inevitable effect of ageing. Tibb is well able to counteract these changes with lifestyle changes and herbal therapy, both of which support Physis, our inner healing vital force.

## Background

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Until quite recently coronary heart disease was a rare condition. However, in the 1930s and 1940s it began to appear more and more frequently, particularly in the Westernised, developed world. By the 1950s it became almost an epidemic. Several explanations were put forward to explain this puzzling observation. They included reduced physical activity due to an increasingly sedentary way of life and more mechanisation, greater consumption of saturated, animal fats, less fibre present in our refined foods, and the emergence of trans-fatty acids in food processing.

Ways of measuring total cholesterol in blood rapidly and accurately became generally available several decades ago, followed shortly afterwards by the ability to assess its different forms like LDL and HDL cholesterol. The focus of attention quickly switched to cholesterol as the culprit behind the rise in heart disease, and its level in blood soon became accepted as a convenient marker for the health risk it imposed. As a result, cholesterol became effectively and thoroughly demonised, and was labelled as the villain responsible for the onset and

development of not only coronary heart disease, but certain forms of stroke, some blood circulatory disorders, and even Alzheimer's.

Terms such as “bad cholesterol”, “the war on cholesterol”, and “drive down your cholesterol” became commonplace. Most people now assume that cholesterol is a toxic substance, a “Sword of Damocles”, hanging over their heads, which could bring about heart attacks and other catastrophic conditions if not strictly controlled – preferably by conventional drugs according to the Pharma Industry.

This scenario was the impetus for the development of cholesterol-lowering drugs. Fibrates, nicotinic acid derivatives, fat absorption inhibitors, statins, new chemical entities, vaccines, and monoclonal antibodies have arrived, or will shortly. Several of these new-to-nature substances, especially the statins, interfere with the normal synthesis of cholesterol, and without doubt reduce LDL blood cholesterol impressively. They do, however, interfere with other essential metabolic processes, which often explains their numerous side effects and long term clinical problems.

Over-consumption of eggs and saturated animal fats, present in meats and dairy products, was identified as the cause of high cholesterol in the body. An intensive campaign extolling the virtues of low-fat products was launched. However, the increasing prevalence of overweight and obese people has led to a re-evaluation of the role of saturated fat in the diet. The spotlight has now switched to sugar in all its various forms as the more likely villain in the story, and saturated fats have now been rehabilitated in some clinical quarters. However, this issue remains a controversy that rages to this day.

Moreover, there is considerable debate about the true efficacy of statins, the major cholesterol lowering drug. There is no doubt that it is effective in lowering cholesterol by inhibiting its enzymatic natural synthesis in the body. However, its ability to reduce the rate of heart attacks and strokes is being increasingly challenged, and open to much heated discussion.

*Tibb views high cholesterol as the consequence of excess or abnormal melancholic humour, as a result of a dysfunctional lifestyle coupled with poor personal habits and the ageing process. It is therefore well-placed to deal with this serious health care challenge, as it offers sound well-tested advice on lifestyle improvement. Treatment involves meaningful changes to lifestyle and habits, combined with measures to support Physis, the body's intrinsic self-healing capacity.*

## **Cholesterol and arterial disease**

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The arterial walls are not passive structures, but made up of multiple layers of highly active, dynamic and responsive tissue. When small LDL cholesterol particles are present locally in high concentrations, some seep through the top layer into the lower layers, forming a threatening blister-like structure.

Until quite recently, atherosclerosis was thought to be due to fibrous plaque building up on damaged sections of the arterial walls' inner lining, or *endothelia lining*. Lumps of adhesive fat, fibre, platelets and other miscellaneous blood cells would form a hardened plaque. As these increased in size they cut down blood flow, causing chest pain or discomfort – *angina pectoris*. Eventually a possibly catastrophic heart attack occurred. Worse, part of the plaque over time would rupture, or dislodge, especially if the blood pressure was high, leading to heart attack, stroke, kidney failure or blood circulation problems.

However, in atherosclerosis the levels of LDL cholesterol become excessive, so over-extending or overwhelming the actions of Physis. This may be aggravated by the co-existence of hypertension. When high levels of cholesterol occur in the bloodstream, excess LDL, especially in the form of small cholesterol containing particles (see *Appendix*) begin to seep into the inner wall of the artery, and begin to damage the blood vessel lining.

## Risk factors for cardiovascular disease

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The box (*below*) lists the major risk factors for cardiovascular disease. However, many of these risk factors were present well before the start of the present epidemic. This implies that the recent rapid rise in the incidence of cardiovascular disease is linked to factors which have come into play recently. Tibb has identified these, and most of them are related to a dysfunctional lifestyle.

### ***Risk factors for heart disease – innate***

- High LDL, low HDL cholesterol
- Highly oxidised cholesterol
- Diabetes
- Hypertension
- Insulin resistance

### ***Risk factors for heart disease - habits***

- Smoking
- Lack of physical activity
- Unhealthy diet
- Persistent overweight

### ***Risk factors for heart disease - general***

- Getting older

The impact of many of these risk factors can be diminished by reasonable changes to a person's lifestyle, which results in his or her Physis being more actively supported and boosted. Briefly, the changes apply to a person's regular food and drink intake, to physical activity, to elimination of natural and artificial toxins, and to personal habits like smoking and heavy drinking

## The Tibb perspective on cholesterol

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*Tibb believes that atherosclerosis can be halted and reversed through changes to nutrition and other Lifestyle Factors and Tibb therapies in most cases. Tibb treatment also reduces the risk of other melancholic humour linked disorders like osteoarthritis and osteoporosis.*

Cholesterol is a primary feedstock substance required for a broad range of vital substances and metabolic processes in our body, from the synthesis of steroid hormones, bile acids and vitamin D, to the formation, repair and maintenance of cell membranes.

*Tibb accepts that cholesterol in all its molecular forms is absolutely essential for the human body's state of health and healing. Tibb does not regard cholesterol as a toxin. It is not excreted in the person's breath, sweat or urine. It only leaves the body as expended bile acids after being used to aid the digestion and absorption of foods, especially fats.*

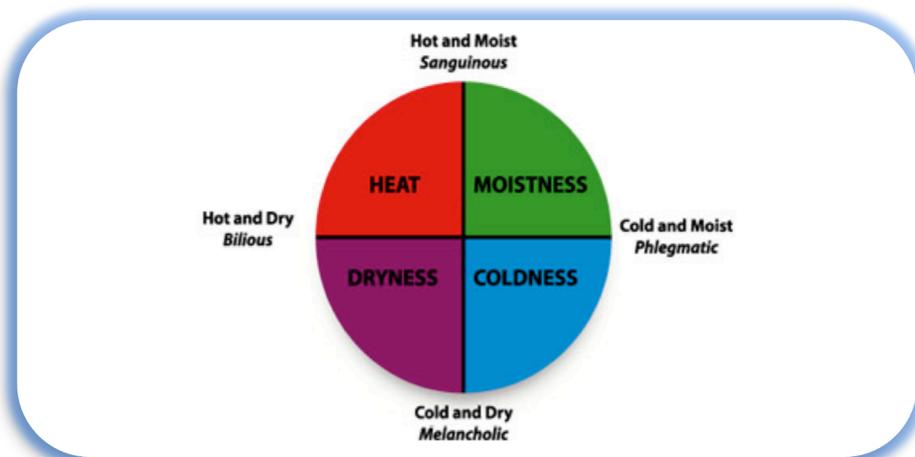
*Tibb's approach to abnormally high cholesterol and the clinical problems that can ensue is understood within the context of the Tibb philosophy based on the following key principles:*

- **Physis**, also known as our inner vital Life Force, is the driving agency which maintains equilibrium, harmony within our living body. In doing so, it effectively controls the formation, activity and subsequent destruction of all living cells, the tissues they form, and the internal organs they become. It regulates body energy flow, which is central to life; how and when energy is formed, how it is distributed, and how and where it is stored. These are critical functions in maintaining internal harmony, as energy is the key factor of the diet, sleep, movement of rest.

All the different systems in the body – circulatory, respiratory, digestive, communication, immune systems, etc. – have their own internal organisation. However, they do not work in complete isolation, but are each connected to the other systems in order to function properly. This is achieved through the medium of hormones, nerve impulses, cytokines, messenger molecules and various growth factors. Each is aware of the activities and

problems of the others. In our bodies, Physis has the innate ability to orchestrate all these inter-connected systems, a phenomenon known as *homeostasis*.

- **Temperament.** Tibb recognises that each individual is unique. Although each person is as unique as his/her fingerprint, Tibb divides people into a combination of four broad categories, Sanguinous, Phlegmatic, Melancholic and Bilious, with a dominant and a sub-dominant temperament. Each temperament has qualities of heat, coldness, moistness and dryness with every combination having an overall quality. The picture below/adjacent describes temperament and qualities and shows that a person with a combination of a Sanguinous and Bilious temperament will have an overall quality of heat. Similarly the Phlegmatic/Melancholic temperament will have an overall quality of coldness – this explains why some people feel hot while others always feel cold.



- **Humours.** The *humoral theory* is based on the hypothesis that just as each individual has a unique temperament each person also has an ideal humoral balance, made up from the four humours: sanguinous, phlegmatic, bilious and melancholic with a combination of the qualities similar to those of the temperament. Tibb philosophy states that as long as the overall quality of the humours is in line with the overall quality of the temperament of an individual, homeostasis (or harmony) will be maintained. Whilst the overall quality of an individual's temperament is fixed, the overall quality of humours are subject to change arising from the lifestyle factors such as food and drink, environmental air and breathing, movement and rest, sleep and wakefulness, emotions, and elimination. A right proportion according to the quantity and quality constitutes health, whereas an imbalance according to the quantity or quality leads to disease. Each person has a unique concentration of humours that is in harmony with the qualitative state of the person's temperament.

## Features and functions of the humours

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### Sanguinous Humour (*Hot & Moist*)

The sanguinous humour is present in the largest concentrations. Its function is to provide nourishment to every cells tissue and organ within the body. The sanguinous humour serves as the carrier for the other three humours. An excess of this humour results in conditions linked to an abnormally high volume of bodily fluids such as primary hypertension.

### **Phlegmatic Humour (Cold & Moist)**

The phlegmatic humour is the second most abundant humour. It serves as a general lubricant within the body. It prevents friction between and within body structures, so protecting the body's internal organs and structures like the skeletal joints. Examples of this include synovial fluid and cerebrospinal fluid. An excess of this humour results in phlegm related conditions such as recurrent upper respiratory tract infections.

### **Bilious Humour (Hot & Dry)**

The bilious humour allows for the thinning of the vascular fluid due to its Hot & Dry qualities, so facilitating its penetration into narrow capillaries. It prevents the formation of blood clots (*emboli*), by exerting its anti-melancholic and anti-coagulant properties. An excess of this humour results in inflammatory conditions such as gastritis.

### **Melancholic Humour (Cold & Dry)**

The melancholic humour provides density and consistency to the vascular fluid and aids in the activity of platelets in the blood coagulation process. An excess of this humour results in a congealing action which is associated with Cold & Dry qualities.

### **Abnormal Humours**

Whilst we may not fully understand the exact mechanisms underlying the manifestation of abnormal states of humours, the existence thereof can be identified in various pathologies. Interaction with the lifestyle factors, the use of synthetic medications, suppression of eliminative symptoms, and prolonged fevers are some of the causes which underpin the transition from normal to abnormal humoral states.

An example of an abnormal state is observed in rheumatoid arthritis where the protective and lubricating functions of the phlegmatic has been lost due to its corruptions, causing it to become too hard or too thin thus eradicating the soothing properties of this humour.

It is important to note, that all humours can become abnormal forms of the melancholic humour with qualities of coldness and dryness. This becomes more prevalent with increasing age as there is a reduction in innate heat and moistness akin to the reduction of metabolic processes with age.

*Each humour has specific qualities and functions associated with it. These have opposing actions in order to maintain homeostasis, a process which is under Physis control. However, when the humours become excessive or abnormal, Physis may be unable to remove these from the body effectively and in good time. The outcome is that clinical disorders linked to the qualities and/or functions of the humour may develop.*

*For example, abnormal or excessive bilious humour results in prolonged or heavy menstrual bleeding, whereas abnormal or excessive melancholic humour may lead to vascular lesions such as ischaemia.*

Tibb considers high cholesterol blood levels to be the result of an accumulation of excess or abnormal melancholic humour with its Cold & Dry qualities. Cholesterol is a combination of two words: 'chole' means bile and 'steros' means freeze. When the bilious humour, with its intrinsic heating quality, is pacified due to excess cold, the inadequate supply of heat required for metabolism results in increased levels of circulating cholesterol. The coldness and dryness qualities gradually increase, to the detriment of the heat and moistness qualities. The increase in the cold and dryness therefore qualities favours the formation of plaque in the inner lining of the blood vessels.

- **Lifestyle Factors.** Tibb is convinced that what and how we eat, how active we are, how we manage stress and degree of exposure to environmental toxins, which Tibb collectively terms "lifestyle" have a major impact on our blood pressure, blood sugar and cholesterol levels. Tibb does not accept the present way that conventional medicine treats, and prevents, these disorders. Lowering blood pressure, sugar and cholesterol with powerful, new-to-nature drugs is merely minimising the main risk factors, rather than dealing with the underlying cause – a faulty lifestyle.
- **Causation.** As with all chronic, non-acute disorders linked to an inadequate or unbalanced lifestyle and unwise personal habits, Tibb believes in addressing the underlying causes, rather than suppressing the signs and symptoms. Tibb's approach is to investigate what is causing serious disharmony in these biological parameters. We see mounting evidence that reasonable and acceptable changes to a person's lifestyle is a more effective therapy for preventing heart disease than is permanent drug treatment, which is increasingly been shown as rather ineffective in the long run.
- **Management.** The conventional medical approach to this health threat is to minimise the amount of circulating cholesterol by means of cholesterol-reducing drugs. However, Tibb's approach is to address the problem by appropriate lifestyle improvements and changes to personal habits, and to support Physis by various means.
- **Drug usage.** Tibb avoids the use of synthetic, new-to-nature chemicals to lower elevated cholesterol levels. Instead it focuses on supporting Physis through lifestyle improvements, changes to destructive habits, and the use of herbal and other therapies.
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*Tibb accepts the use of the terms "good" and "bad" cholesterol as useful descriptors of different forms of cholesterol which either lower or raise cholesterol. However, it regards cholesterol itself as an essential contributor to body health and healing. When certain cholesterol-containing components become excessively high or low, and beyond Physis' ability to compensate naturally, then the disturbed harmony can lead to serious clinical disorders. This may be due to genetic factors, or temperamental inclination, or, most likely these days, to an unbalanced lifestyle, especially regarding nutrition, exercise and other Lifestyle Factors.*

## The Tibb approach to raised cholesterol levels

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The Tibb understanding of high cholesterol levels in the blood is the result of an excess/abnormal melancholic humour, which possesses Cold & Dry qualities. The result of this is that normal levels of heat diminish, allowing the formation of fatty plaques in the major blood vessels. The plaques are made up of LDL-cholesterol, fibrin, saturated lipids and calcium salts. This leads to a marked narrowing of the blood vessels lumen. Blood flow to body tissues slows down, causing chronic ischaemia. Eventually the blood vessels become so constricted that a clinical catastrophe such as a stroke or heart attack becomes inevitable.

People with a melancholic dominant temperament are therefore particularly at risk, due to their inherent cold and dry nature. This also explains why the elderly are at higher risk of the disorder, as a typical feature of the ageing process is an increase in Cold & Dry qualities. People with temperaments other than melancholic may also develop the condition if they pursue an inadequate diet and fail to respect other Tibb Lifestyle Factors, because these lead to excess of the cold and dry qualities.

*Tibb treatment therefore aims to restore qualitative balance in favour of increased heat and moistness. This is achieved by advising on suitable changes to lifestyle and personal habits, the use of certain therapies, and by consuming herbs which are qualitatively hot and moist.*

- **Food and drink**

Foods and drink which increase hot and moist qualitatively should be selected. These include meats like lamb, chicken and liver, oily fish, veggies like marrow and spinach, and use olive oil, ginger, turmeric and garlic when cooking. In principle a health promoting diet of different seasonal fruits and green leafy veggies, whole grains, beans and nuts should be adopted. Hard meats like beef, citrus fruit and milk products like yoghurt should be avoided, as should sugar-rich foods. The consumption of processed foods, which are often sugar-rich and loaded with trans-fatty acids, salt to excess, fructose syrup and a miscellany of chemical additives, preservatives, colourants, etc., should be reduced markedly.

*Tibb regards a balanced diet as the basic first step on the path to cardiovascular health, especially if begun in the early years. Eating seasonal veggies and fresh fruits in moderation, and reducing our intake of sugary products, fried and processed foods is recommended. Also is eating leaner meats, oily fish and chicken instead of red meats. Increasing the intake of nuts, legumes, fish oils, high-fibre grains such as oats, and drinking green tea also helps enormously.*

Various herbs and spices are known to increase the hot and moist qualities, and should be included in general food preparation wherever possible. The main ones are garlic, ginger, turmeric, pepper and mint.

- **Exercise**

Increasing general activity, especially as regular exercise, is a proven way to both reduce chronic inflammation and to boost health in general. The heart and circulation particularly benefit.

*Tibb recommends a minimum of 20 to 30 minutes exercise, such as brisk walking, at least 5 times weekly. Physical activity that is in harmony with the person's temperament is advised. Each person should select the type of activity that suits his or her temperament, and is stress-free and enjoyable – which will encourage long-term adherence.*

- **Losing weight**

Anyone who is markedly overweight benefits substantially from the loss of a few kilos. In particular, raised cholesterol levels should trend back to the normal for someone of the same age, sex and ethnic background. This may be achieved by a combination of the above dietary changes and increased physical activity.

- ***Quality sleep***

There is increasing evidence that the length of time someone sleeps influences their blood cholesterol levels. Both too little and too much have a negative impact on blood lipids. The need for regular, good quality sleep is therefore an important aspect of lifestyle management. This effect may be linked to their way of life – too much stress, junk food consumption, and irregular eating habits, lack of regular exercise and sedentary job, and smoking. All these can increase cortisol levels, which increase chronic inflammation. Poor sleep may also interfere with hormones *ghrelin* and *leptin*, which are involved in appetite and food consumption.

- ***Personal habits***

*Smoking*, which exerts a substantial drying effect on the airways, is without doubt a major culprit in inducing chronic inflammation in most parts of the body, and especially in the blood vessels' endothelial lining. Giving up smoking reduces the risk almost immediately, and much more over time. Abnormally high levels of cholesterol should revert to normal, and inner harmony will be restored to the cholesterol metabolic situation.

Although moderate, responsible *drinking of alcohol*, especially wine, often improves the cholesterol profile; excessive, regular or binge drinking, however, undoubtedly has a bad effect. Cutting down will improve the cardiovascular risk profile, and confer other different health benefits.

- ***Herbal medication***

Herbal medicine has traditionally been, and remains, a major form of treatment for a wide range of disorders. Together with the therapeutic benefits of a sound lifestyle, herbal remedies are at the forefront of Tibb treatment. The main aim of herbal remedies is to reverse the trend to a cold and dry melancholic condition, and so restore humoral balance. There is a major revival of interest underway as we learn more of our body's complex mechanisms and metabolism, in both health and disease.

Formulating individualised herbal infusions (or *teas*) as reliable and easy-to-use herbal remedies represent a step forward in the treatment of both acute and chronic disorders. In addition, if these infusions target specific humoral disharmonies linked to specific disorders, then substantial clinical benefit can be expected.

Tibb has formulated a unique herbal tea for the treatment of cholesterol-related disorders. It contains a number of traditional herbs with proven hot and moist qualities which oppose the excess melancholic humour, including yarrow, agrimony, dill seed, liquorice and senna. This tea has been tested in patients with conditions characteristic of excess melancholic humour, with encouraging results.

*For Tibb, moderation and a sensible way of life are the ways to go for most people with abnormally high blood cholesterol. There has to be balance in the lifestyle factors which support Physis. This is best achieved through health-promoting nourishing food and drink, appropriate exercise, proper elimination of natural waste and artificial toxins, and good sleep hygiene.*

## Natural ways of lowering high cholesterol

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There are practical and acceptable ways to reduce abnormally high cholesterol levels, without having to resort to potent drugs. These either involve making changes to diet and lifestyle, or altering personal habits. Their net effect is to reduce underlying tissue inflammation which is responsible for raised cholesterol levels.

- ***Increase physical activity.*** Regular exercise lowers raised blood cholesterol levels. It also improves blood circulation and tones up the immune system, so benefitting health status in general.
- ***Increase intake of health-promoting fats.*** Olives, avocado, seeds, dairy products (in moderation) and olive oil help lower high cholesterol levels.
- ***Eat more fatty fish.*** Adding regular portions of mackerel, pilchards and sardines, which contain beneficial omega-3 fatty acids, reduces total cholesterol.
- ***Consume more raw nuts daily.*** Regular consumption of almonds, for example, reduces LDL cholesterol and improves heart health.
- ***Reduce white sugar consumption.*** The fructose present in white sugar leads to chronic inflammation when taken regularly in excess, and increases cholesterol. Lowering sugar intake gradually opposes this rise.
- ***Reduce certain habits.*** Curtailing smoking and avoiding excessive drinking counteracts the rise in cholesterol which usually accompany these.

### ***Can cholesterol levels be too low?***

All living cells need cholesterol to survive and thrive, and this applies especially to nerve cells within the brain. Men with chronically low cholesterol levels are more prone to depression, possibly because cholesterol is needed for the synthesis of the “feel good” neurotransmitter *serotonin*. Suicide and violent behaviour have also been connected to abnormally low cholesterol levels. An increased risk of developing cancer and Parkinson’s disease, both of which are cold and dry disorders, has also been linked to abnormally low cholesterol levels.

### ***Can HDL-cholesterol levels be too high?***

The conventional medicine distinction between “bad” (LDL) cholesterol and “good” HDL) cholesterol has led to the search for drugs which keep levels of the former LDL low, while at the same time boosting levels of the HDL for. HDL is reputed to scavenge excess cholesterol from the inner lining of the blood vessels, so lowering the risk of heart disease and strokes. The mantra here was: “the higher, the better”.

However, a growing body of evidence suggests that too high a HDL level may in fact neither confer benefits, or actually cause harm.

For Tibb, this illustrates the need to seek harmony within the cholesterol (and other) systems. LDL conveys cholesterol from the liver to body tissues where it is needed for cell wall repair and strengthening: HDL collects surplus cholesterol from these tissues for return to the liver for redeploying.

## Drugs used to lower blood cholesterol levels

There is a relatively wide range of drugs used to treat elevated cholesterol blood levels. The table below summarises the main points of the main groups:

Drug type	Mechanism of action	Effects	Disadvantages
Statins	Inhibit key enzyme HMG-CoA reductase in cholesterol synthesis	Lower liver synthesis. LDL reduced, HDL rises slightly	Muscle pain and weakness, headache, dizziness, GI tract upsets, visual problems
Fibrates	Complex action involving gene transcription and lipoprotein synthesis	They lower triglycerides and raise HDL cholesterol.	Constipation, diarrhoea, dizziness, headache, stomach pain
Resins	Resins bind to bile acids, preventing their re-absorption. This increases bile acid synthesis in the liver, using cholesterol.	LDL-cholesterol falls. No effect on HDL or triglycerides	Constipation, heartburn, nausea, flatulence
Niacin	Not fully understood, but seems to have several mechanisms involving lipoproteins.	LDL cholesterol and triglycerides lowered and HDL raised	Flushing of face/neck, tingling in legs and feet, nausea and vomiting, diarrhoea, jaundice, stomach ulcers, itching, liver damage.

The most popular one at present are the statins.

### How do statins work?

Statins act on one liver enzyme located on the metabolic pathway from acetate to cholesterol. It inhibits the key enzyme (HMG CoA reductase). This slows down the formation of cholesterol, and leads to a fall off in its blood level. There are several statins now available. They all block the same enzyme in the liver, but to different degrees.

**An adult contains about 35 grams in total. Around 1000 mg of cholesterol is bio-synthesised daily, and the intake of cholesterol from the food consumed in a Westernised diet is about 200 to 300**

Statins do not just inhibit cholesterol synthesis – they interfere with other metabolic and biochemical activities that involve the target enzyme. This broad inhibitory effect is probably at the heart

of many side effects reported for the statins.

### Side effects of the statins

Between 10% and 35% of patients receiving statins (depending on the study) appears susceptible to side effects. Most commonly reported are:

- Joint pain, skeletal muscle soreness (*myopathy*), and weakness.
- Dry, sore and irritated breathing passages.
- Spontaneous nose bleeds (*epistaxis*).
- Constantly blocked nose.

Other less common side effects linked to the statins are headache, nausea, constipation and flatulence.

Anecdotally, the most common complaint appears to be fuzzy thinking and memory loss, often described as “brain fog”. Recently, reports of an increased risk of patients developing type 2 diabetes or ageing prematurely have been circulating.

### **Other adverse effects of the statins**

Statins interfere with the production of *mevalonic acid*, which is the end product of HMG CoA reductase activity. Mevalonic acid is rightly called the “building block of life”, as it is the feedstock for at least three other essential substances in the body – *ubiquinone*, *dolichol* and *squalene*.

- **Ubiquinone**, aka *Co-enzyme Q10*, is essential for the proper function of mitochondria, the body’s heat generating “power stations” located in all living cells. It is a key element in producing *ATP*, the universal energy currency of living tissues. It helps maintain the integrity of the cell membranes, and is very involved in the operation of heart and lung tissue, and nerve and muscle function. People deficient in this co-enzyme suffer from muscle wasting, constant physical weakness, back pain and tingling nerves. It also causes inflammation of the muscle ligaments and tendons, sometimes with dire consequences. This is why people taking statins are often advised to take a CoQ10 supplement.
- **The dolichols**. This group of substances acts as cell messengers, and plays a very important role in guiding newly synthesised proteins to their proper destinations inside and outside the cell. Interestingly, they are present at high levels in a part of the brain (the *substantia nigra*) that regulates skeletal muscle activity. Many of these proteins are thought to be involved in the expression of emotions, efficient immune system functioning, and passing messages between cells.
- **Squalene**. This complex substance is on the same pathway from acetate that leads to cholesterol. This too is reduced by the action of the statins. Lowering the synthesis of squalene has consequences, as it appears to be implicated in the formation of blood vessels. Squalene is considered to be an important component of the Mediterranean diet, which is qualitatively hot and moist, and so opposes plaque formation. As such it may be a protective agent against the formation of cancer. The recent assertion that statins may protect against cancer is at odds with this.

### **Summary**

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Abnormally high cholesterol levels in the blood are linked to increased risk of heart attacks, strokes and other serious circulatory disorders. In most cases the rise in cholesterol is due to dietary and other lifestyle factors, although some arise from genetic reasons. Conventional cholesterol lowering drugs are undoubtedly effective, but they are linked to side effects and long term adverse reactions which often compromise their usage. There is also some controversy whether the incidence of heart attack and stroke is actually diminished.

Tibb does not consider cholesterol as a toxin, but as an essential substance for the health and maintenance of the body tissues. It regards high blood cholesterol as an indicator of an increase of excess/abnormal melancholic humour and its Cold & Dry qualities. This is the inevitable outcome of poor nutrition and a faulty lifestyle, coupled with imprudent behaviour. It is also characteristic of the ageing process.

Measures suggested by Tibb include making significant changes to the diet, so that more hot and moist foods are included. Other Lifestyle Factors, so that the hot and moist qualities are likewise increased. The use of herbs and spices which are hot and moist qualitatively is also encouraged.

One advantage of the Tibb approach is that it does not interfere with the operation of Physis, so allowing natural healing and homeostasis to proceed unimpeded, thereby reducing the risk of other disorders like type 2 diabetes and hypertension, and age-related conditions like osteoporosis and osteoarthritis.

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## **Appendix: Cholesterol – its nature, different forms, and roles in the body**

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Cholesterol is a **steroid**, and an essential part of all living cells' membranes. Without it life would be impossible. It only occurs naturally in animals. Other living creatures have equivalent but different forms of this steroid, such as *phytosterol* (in plants) and *ergosterol* (in fungi).

There is absolutely no doubt – cholesterol is a major influence on our body's basic metabolism, with a variety of beneficial roles. It may even be a major player in naturally preventing certain cancers, possibly because of its anti-oxidant activity

### ***Cholesterol is involved in the following:***

- *Cell membrane construction and repair*

Cholesterol is a major structural component of the membranes surrounding all living cellular tissue. Together with other specialised fats it makes up the structure of each and every cell in the body. If the cholesterol content of cell membranes is reduced, both basic bodily metabolism and the ability to produce energy are severely affected. Cholesterol is needed when healing tissue damage, and is present in protective scar tissue.

- *Endocrine gland operation*

Cholesterol is the feedstock for all steroid hormones, which control the body's metabolism of sugar and minerals, and regulate sex behaviour, stress responses, inflammation and the healing processes. These hormones carry out a myriad of functions in the body, ranging from energy production, regulation of metabolism, essential mineral absorption and bone and tissue formation, to influencing our behaviour, emotions and reproduction.

- *Digestion*

Cholesterol plays a critical role in the body's digestion processes. It is the building block of the bile salts *biliverdin* and *bilirubin*, which help in digesting the food we consume. In fact, most cholesterol synthesised in our body is used to produce bile salts. Without these, which act as emulsifiers, our body is unable to digest fats, or absorb nutrients and fat-soluble vitamins. Without them undigested fat particles enter the bloodstream and cause clinical problems due to blockages of the arteries in the heart and brain.

- *Vitamin D<sub>3</sub> activity*

Cholesterol is the main precursor of **vitamin D**, which is essential for bone formation from minerals. Vitamin D<sub>3</sub> is naturally synthesised in the skin by the action of sunlight on dehydro-cholesterol. It has a central role in calcium metabolism and bone health. New roles have been uncovered for it in diverse areas such as mental health, the immune system, and even cancer prevention.

- *Diabetes*

The onset of diabetes in all forms is closely linked to low vitamin D<sub>3</sub> levels. In addition, obesity, certain heart diseases, hypertension, stroke, and many chronic disorders occur more often when vitamin D<sub>3</sub> levels are low. Fertility is positively influenced by high vitamin D<sub>3</sub> levels.

- *Nerve impulse transmission*

Cholesterol is an integral part of the insulation around the brain's nerves, preventing leakage of the electrical impulse during nerve signal conduction. In particular, it is essential for proper memory storage.

- *Sleep*

Good quality sleep is necessary for enhancing newly acquired skills, consolidating memories, and maintaining brain activity in general. One reason sleep is beneficial in areas of learning and memory is because it enables our brain to make more use of cholesterol. This is an important factor in the formation of nerve connections, or *synapses*, in the brain, which form the basis of our learning and memory. These benefits of sleep are probably connected to the fact that cholesterol synthesis increases during sleep.

### **Synthesis of cholesterol**

The process by which cholesterol is formed is a long and complex one, starting with simple acetate and ending, five major metabolic steps later, with cholesterol.

Cholesterol in the body is derived from two sources:

- **Exogenous** – from the food we consume, mainly from animal meats and dairy products
- **Endogenous** – from synthesis in the body, mainly in the liver

### **Dietary (exogenous) source**

Cholesterol-rich foods include most fast, processed foods, eggs, liver, fish, butter, shellfish, shrimp, bacon, sausages, red meat, cheese, and pastries.

### **Biosynthesis (endogenous) source**

Cholesterol synthesis in the body proceeds in six enzyme-controlled steps:

1. The basic primary metabolite acetate is activated to acetyl co-enzyme A (acetyl CoA).
2. Acetyl CoA is converted to an isoprene compound\*, labeled HMG-CoA.
3. This is converted to mevalonate, an important building block in the body. This is where the statins generally act.
4. Mevalonate is changed to IPP\*\*.
5. IPP is converted to squalene.
6. Squalene is converted to cholesterol.

(\*) **Hydroxy-methyl glutaryl co-enzyme A**

(\*\*) **Isopentenyl pyrophosphate**

### **Different forms of cholesterol**

The concept of “*total cholesterol*” is a convenient biochemical parameter, but vague, simplistic and confusing. The many forms of cholesterol present in the body have been bundled together with little acknowledgement of the specific role each form plays. Cholesterol includes a number of components – low-density lipoprotein (LDL), very low density lipoprotein (VLDL), high-density lipoprotein (HDL) forms, lipoprotein LpA, chylomicrons, and several more. Each has a specific function.

Cholesterol, in common with other fats, does not physically dissolve in blood because it is water-repellent, or *hydrophobic*. Cholesterol and other fats must therefore be combined with a water-soluble carrier protein which makes them soluble in blood, or *hydrophilic*. Only then can cholesterol etc. be shuttled to and from the sites where they are located or needed.

LDL, commonly labelled "bad" cholesterol, is, in excess, considered the cause of a build-up of fatty deposits inside the artery walls, which leads to heart disease. HDL is regarded as "good" cholesterol, because its role is to remove cholesterol deposits from the lumen of blood vessels and return them to the liver for re-use.

LDL particles come in many sizes. Large LDL particles are not regarded as a problem clinically. Only the so-called small dense LDL particles, especially if oxidised, are thought to be the culprits. An important form of LDL which is more damaging is *lipoprotein (a)*. This is an independent risk factor for coronary artery disease. These are more likely to cause damage to the blood vessel lining, leading to the formation of plaque.

The reason is that they can force themselves through the endothelial lining of the arteries and can cause inflammation. High blood pressure is an accomplice in this damaging process, as it drives these particles into the lumen wall.

## Further reading

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