



# Medicine for Managers

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## Statins

**Cholesterol and its role in cardiovascular disease was established in the 1950s. Japanese biochemist Akira Endo investigated the disorder in the early 1970s and discovered the first cholesterol-lowering drug called Mevastatin, isolated from a fungus in 1973. However, it had serious side-effects in experimental animals, but by the late 1970s, different statins were marketed and their dramatic effects on millions of lives were quickly recognised.**

**T**he Scandinavian Survival Study in 1994, sponsored by Merck pharmaceuticals, studied 4,444 patients with raised cholesterol and heart disease.

After five years the study showed that patients had an average reduction of 35% in their cholesterol and death by heart attack was reduced by 42%.

In England, the number of patients taking an anti-cholesterol drug has now risen to 5.3 million and it is estimated that as many again could benefit from use of the drug to protect against cardio-vascular disease.

Heart diseases, aggravated by cholesterol, are:

- Coronary artery disease and atherosclerosis
- Angina
- Heart attacks
- Strokes and transient ischaemic attacks
- Peripheral arterial disease

Cholesterol itself is a fat-like, waxy essential substance, which is necessary for development of healthy cells, hormones and to digest fats.

It is part of every cell membrane and is used to synthesise Vitamin D and steroid hormones. There are two types of cholesterol:

- **High Density Lipoprotein**, (HDL), often called 'good' cholesterol, clears excess cholesterol from arteries and reduces risk of heart disease.
- **Low density Lipoprotein**, (LDL), often called 'bad' cholesterol, may contribute to arterial build-up of plaque in arteries, increasing risk of stroke and heart disease.

In a healthy individual, HDL should be 1 mmol/L or above for men (1.2 mmol/l for women). LDL should be 3 mmol/l or below.

Total cholesterol should be 5 mmol/L or below.

In addition non -fasting triglycerides should be 2.3 mmol/L or below and fasting triglycerides should be 1.7 mmol/L or below.

To help keep LDL below 3 mmol/L, it helps to:

- Avoid saturated fats and excess calories
- Exercise regularly
- Maintain a healthy weight
- Not smoke

Other factors increasing risk of cardiovascular disease include age over 70, some ethnic groups, being overweight and a family history of CVD.

Statins are offered to patients with:

- raised blood cholesterol levels (or other types of fat, including familial hypercholesterolaemia)
- Atheroma related heart or arterial disease
- A 10% or more increased risk of developing heart disease within ten years

Patients have blood tests to establish the base level of cholesterol and lipids, and also to ensure that the liver is working properly, before starting a statin. Normally, the blood tests are repeated after two or three months of statin usage, and again after twelve months.

Five types of statin are available in the UK with a prescription:

- Atorvastatin, most commonly used
- Simvastatin
- Pravastatin
- Fluvastatin
- Rosuvastatin

Not all statins suit everyone, and consequently different ones may be tried to identify the most suitable.

The dose of the statin is adjusted as necessary to achieve an acceptable blood level for the various lipid elements. There is no definitive figure but as a guide, the levels desired are:

- Total Cholesterol below 5 mmol/L
- HDL above 1.0 mmol/L for men or 1.2 mmol/L for women
- LDL below 3 mmol/L

Some studies have shown that up to half of patients on statins do not achieve the required reduction in LDL or total cholesterol. This may be because they fail to take the medication regularly or because the dose of statin is inadequate.

Atorvastatin is used at a dose of 20 mg/day but may be increased up to 80 mg/day to achieve the necessary reduction. Failure to reach the desired reduction increases the risk of heart attack or stroke within 6-10 years.

Statins are generally well tolerated but some patients do experience side effects, usually minor. Most common complaints include:

- Headache
- Abdominal pain, bloating and diarrhoea
- Nausea
- Pins and needles

Occasionally, a patient may experience muscle damage (myopathy) and anyone taking a statin should notify the doctor if experiencing muscle pain, tenderness, weakness or cramp. Any breathing problems should also be reported.

Statins should not be taken by anyone taking ciclosporin. The doctor should also be notified if taking antibiotic as some may interfere with statins.

In addition statins should not be taken if:

- Pregnant or intending to be pregnant
- Breastfeeding
- Having liver disease

In addition, grapefruit should not be eaten or grapefruit juice drunk if taking simvastatin, atorvastatin or lovastatin because it raises the blood level of the statin and may make side-effects more common.

If statins can't be used or are ineffective, there are other alternatives.

1. **Ezetimibe** (Ez-ee-tim-ee-bee) which prevents cholesterol absorption from the gut.
2. **Cholestyramine** and related drugs, which stop bile acid absorption in the gut and lower cholesterol as a result
3. **Bezafibrate** and other related fibrates are used in patients with high triglycerides
4. **Fish oils**. These reduce blood lipids and occur naturally in fish such as mackerel. 1-2 portions a week contributes to a healthy diet

Some statins can be purchased over the counter without a prescription.

However, reducing cardiovascular disease by controlling cholesterol levels and having a healthy lifestyle (not smoking, avoiding excess weight, eating healthily, limiting alcohol and exercising regularly) are the keystones to minimising the risk.

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