



## GRAVES' DISEASE & THYROID FOUNDATION

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# Cholesterol Management in Graves' Disease

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Serum cholesterol levels are affected by thyroid function. Patients with Graves' disease sometimes show elevation of blood cholesterol levels just after their thyroid function returns to normal. Serum total cholesterol levels are made up of four major components: chylomicrons, very low density lipoproteins (VLDL), low density lipoproteins (LDL), and high density lipoproteins (HDL).

**HDL is the "good" cholesterol as it helps the body rid itself of the "bad" cholesterol (LDL).**

The reason high cholesterol is treated is that as cholesterol levels in the blood rise so does the risk for coronary artery disease. This can lead to angina, heart attacks, and stroke. For every reduction of total cholesterol by 1 mg/dl, one decreases the risk of developing heart disease by 1 to 2%. For every reduction of LDL by 1 mg/dl, the risk of

heart disease decreases by 4.4%. For every elevation in HDL by 1 mg/dl, the risk of heart disease decreases by 5.5%.

Desirable cholesterol levels are: total is less than 200 milligrams per deciliter (mg/dl); LDL less than 130 mg/dl; and HDL greater than 45 mg/dl. Sometimes the "total cholesterol" will be reported as high, but when the amount of HDL is compared to the amount of LDL, the LDL to HDL ratio falls within a normal range (LDL to HDL ratio of 3.0 or higher). In any case, whenever plasma total cholesterol or LDL values are reported as "high" patients should immediately contact their physician for consultation and possible follow-up therapy.

Other risk factors for heart disease are: a family history of heart disease, smoking, obesity, high blood pressure, diabetes, and being a male. Note, that while a patient has

no control over family history or gender; smoking, obesity, diet and exercise are all variables that can be altered to reduce the incidence of heart disease.

Cholesterol management is not really specific to Graves' disease, but rather to the hypothyroidism which can result from the treatment of Graves' disease. Hypothyroidism can lead to an elevation in serum cholesterol. Because serum cholesterol levels are affected by thyroid function, therapy for high cholesterol levels should be made once normal thyroid function has been achieved in patients with Graves' disease.

### Treatment

**Diet:** The first line therapy for high cholesterol levels is proper diet management. As dietary fat and cholesterol are reduced so is the risk for heart disease. A low fat, low cholesterol, and low saturated fat diet is very important.

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What type of diet one should eat should be discussed with a doctor and a dietician. Any diet regimen designed should be followed over an interval of several months before it is considered successful or not.

**Exercise and**

**Smoking:** Being “out of shape” and smoking both have also been linked to the development of high cholesterol levels. Thus, it makes good sense both to acquire a good exercise and physical fitness program and to quit smoking to reduce the chance of high cholesterol. It is essential that prior to initiating any exercise program that the program be discussed with and approved by a doctor.

**Pharmacological:** When diet, physical fitness, and the cessation of smoking are unsuccessful or only partially successful, drug therapy is the next step in the treatment of high cholesterol. The most commonly used agents are listed and discussed below:

1. Questran® (cholestyramine) and Colestid® (colestipol).

- These two agents help increase the metabolism of LDL and help reduce absorption of dietary cholesterol.

- Prior to taking these two agents, they should always be mixed with fluids (water or juice).

- Usual doses: Questran®: because the drug may not be well tolerated upon initial use, the drug is initially given at a dose of 4 gms twice a day with meals. However, as the patient adjusts to Questran® a maintenance dose of 8 gms three times a day is normally achieved with a maximum daily dose of 32 gms allowed.

- Colestid®: an initial dose of 5 gms is taken twice a day with meals, followed by a maintenance dose of 10 gms twice a day with a maximum of 30 gms per day being utilized.

- Side effects that might be experienced are constipation, stomach pain that generally subsides as one continues treatment, and gas.

- Questran® and Colestid® can also interfere with the effects of a number of drugs such as Lanoxin®, Coumadin®, and some thyroid medications. To avoid this, these medications should be taken 1 hr before or 4 hrs after the Questran® or Colestid®.

2. Niacin (nicotinic acid).

- Niacin lowers blood cholesterol levels with maximum effects seen usually in 3 to 5 weeks. The exact mechanism of action of Niacin is unknown at present.

- Dosing Niacin can be difficult. Initially, therapy starts at low doses such as 100 mg three times a day to decrease side effects such as redness and flushing in the face and upper body. Itching and headache may also occur. These effects usually go away as the body adjusts with continued therapy. If flushing continues or is unbearable, one regular strength (325 mg) tablet of aspirin taken 30 minutes prior to the Niacin can decrease the side effects mentioned above. Another way to decrease these effects is to slowly increase the dose over a few weeks to an effective dose of 1-2 gms two to three times a day. Since upset stomach can occur with Niacin, the drug should be taken with meals.

- Because Niacin itself can cause liver damage, patients with liver disease or heavy alcohol users should consult their doctor or pharmacist before taking the drug.

3. Mevacor® (lovastatin).

- Mevacor® lowers cholesterol by inhibiting the

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body's ability to make cholesterol.

- Maximum effects of Mevacor® are usually seen in 4-6 weeks.
- The dose of Mevacor® is initially 20 mg per day with meals. The dosage range is from 20-80 mg per day, but most patients respond to 40 mg per day as they would to 80 mg daily.
- Common side effects that can occur are headache, constipation, stomach cramps, muscle aches, gas and diarrhea.
- Because Mevacor® itself can cause liver damage, patients with liver disease or heavy alcohol users should consult their doctor or pharmacist before taking the drug.
- It has also been thought that Mevacor® causes eye changes that may alter vision. Thus far, these effects have not been found to be important. A periodic eye exam, however, is a good idea.

#### 4. Lopid® (gemfibrozil).

- Lopid® lowers serum triglycerides very well with a moderate reduction in total cholesterol. Lopid® mainly decreases the formation of

triglycerides and inhibits VLDL formation.

- Usual dosage of Lopid® is 600 mg twice a day given 30 minutes prior to the morning and evening meals.
- Side effects that may be seen are abdominal pain, diarrhea, constipation, headache, nausea, and rash. Lopid® can also cause dizziness, so caution should be used when driving.

#### Summary

Managing high cholesterol is a very patient-specific process. Diet may be all that is needed in one person, while it may have no effect on the next person. This also holds true for drug therapy. While undergoing high cholesterol medical therapy, patients should have their blood cholesterol levels monitored closely so benefits of therapy can be seen or adjustments made as needed by their doctor.

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