

# **Cholesterol & Heart Health**

## *King Features*

### **Other Risk Factors**

High triglycerides  
 High Lp(a)  
 Low HDL cholesterol  
 Homocysteine  
 Inadequate B vitamins  
 Excess iron  
 High blood pressure  
 Smoking  
 Excess weight  
 Inactivity  
 Family history  
 Diabetes  
 Hostility or aggressiveness  
 Lack of social support  
 Stress

### **Blood Cholesterol Values**

According to Dr. Barry Sears, creator of the Zone Diet, there is a newer, more sophisticated measurement of heart health. He recommends using the triglyceride/HDL ratio. Ideally, it should be around 1. If this ratio is higher than 2, he says it is a "flashing warning light." Fish oil can help normalize this ratio.

**C**holesterol used to seem so simple. Too much was bad. If you could just get your level below 200 you could pat yourself on the back and rest easy.

Unfortunately, we now know that heart disease is far more complicated than a single number. According to one of the world's leading epidemiologists, "most patients with myocardial infarction [heart attack] have normal cholesterol levels."

As researchers have looked more closely at the factors behind heart disease, they have discovered a whole range of compounds that may be important. For one thing, there are many different kinds of cholesterol circulating in the blood stream. Some are beneficial while others are quite harmful, and the relationship between various lipid levels may provide a better understanding of cardiovascular health than the total cholesterol alone.

High density lipoprotein cholesterol (HDL) is the good guy, carrying cholesterol to the liver for elimination. You can think of HDL as your body's natural garbage disposal system. The higher your HDL, the better your cardiovascular system seems to be. Anything above 45 is considered good. One of the bad actor in the tragedy of heart disease is low density lipoprotein

cholesterol (LDL). The more of this gunk you have floating around, the more likely cholesterol will build up inside coronary arteries. If you can keep your LDL levels below 130 you will reduce your risk.

This means that HDL and LDL measurements may be at least as important in determining heart health as the total cholesterol number. In fact, the ratio of all these numbers, together with other risk factors, gives cardiologists useful insight in planning treatment strategies. The ratio of total cholesterol to HDL may be one of the most helpful numbers on your chart. Ideally it should be 4.5 or lower. To calculate this ratio, simply divide your total cholesterol reading (say 240) by your HDL value (say 40). That would give you a ratio of 6 to 1, which is not so hot. If, on the other hand, your HDL were 80, your ratio would be 3 to 1, and that's terrific!. So in some cases, even if total cholesterol is above 230 there may be no reason to be alarmed if HDL is high enough and there aren't any other significant risk factors. For guidelines to desirable cholesterol levels take a look at the table below.

	<i>Total Cholesterol</i>	<i>HDL</i>	<i>LDL</i>	<i>Total Cholesterol/ HDL Ratio</i>
<i>Target</i>	Below 200 mg	Above 45 mg	Below 130 mg	4.5 or lower
<i>Borderline</i>	200 to 239 mg	35 to 45 mg	130 to 159 mg	4.5 to 6
<i>Danger Zone</i>	Above 240 mg	Below 35 mg	Above 160 mg	Above 6

## Homocysteine:

### Veggies for Heart Health

#### Folic Acid

Collards (cup)=194 mcg  
Brewer's yeast (1tb)=162 mcg  
Spinach (cup)=135 mcg  
Split peas (cup)=127mcg  
Broccoli (cup)=84mcg  
Peanuts (cup)=82 mcg  
Cowpeas (cup)=66mcg  
Turnip greens (cup)=61 mcg  
Green peas (cup)=40 mcg  
Avocado (1)=30 mcg

#### Vitamin B<sub>6</sub>

Cooked prunes (cup) 648 mcg  
Peanuts (cup)=576 mcg  
Sweet potatoes (cup) 313 µg  
Avocado (1) 320 mcg  
Collards (cup) 370 mcg  
Broccoli (cup) 264 mcg  
Potatoes (1) 237 mcg  
Spinach (cup) 234 mcg  
Cauliflower (cup) 228 mcg  
Brewer's yeast (1 tb) 200 mcg

**M**eat eaters have assumed that avoiding red meat, with its fat and cholesterol, would solve the problem of heart disease. Although saturated fat surely is a problem for many people, there may be another substance that contributes to coronary heart disease that has been mostly overlooked. Homocysteine (phonetic pronunciation is homo-sis-tay-een) is a byproduct of meat metabolism. When we eat animal protein our bodies break it down, and one of the resulting chemicals is the amino acid homocysteine.

Over the last 25 years impressive evidence has accumulated linking elevated homocysteine levels to atherosclerosis, heart attacks and strokes. More recent research (*New England Journal of Medicine*, February 2, 1995, pages 286-291) revealed a striking association between high homocysteine levels in the blood and narrowed carotid arteries in the neck. This condition, "carotid stenosis" also predicts increased risk of coronary artery disease and cerebrovascular disease. The greater the thickening of arteries in the brain, the more likely there will be impaired blood flow and a risk of stroke.

Homocysteine is thought to be toxic to arteries. This chemical stimulates the spread of smooth muscle cells that line arteries and this action may contribute to atherosclerosis. For example, when baboons were given high doses of homocysteine, lesions formed in their arteries after three months. And people who are born with a rare enzymatic defect that impairs their ability to metabolize homocysteine may end up with severe cardiovascular disease. This can cause premature death in the teens or early twenties.

For a long time people assumed that only very high levels of homocysteine could trigger this kind of problem. But recent research suggests that even moderate elevations in homocysteine can cause trouble. One of the best studied populations in the world is the town of Framingham, Massachusetts. These folks have taken part in a decades-long experiment to monitor a variety of risk factors such as diet and

cholesterol and their relationship to heart disease. Scientists found that roughly one-fifth of the older people in this group had elevated homocysteine levels. Dr. Meir Stampfer of Harvard has concluded that "homocysteine levels that are elevated enough to matter clinically are relatively common in the general population, and this fact may account for a substantial proportion of vascular disease in the United States."

Unfortunately, many physicians have not heard of homocysteine. It is rarely measured and a strategy for bringing down elevated levels is hardly ever discussed. The good news is that certain B vitamins appear to play a crucial role in controlling homocysteine in the blood. The more vitamin B<sub>6</sub> and folic acid people have, the lower the homocysteine levels. This may partly explain why vegetarians tend to have cleaner arteries and lower rates of heart attacks and strokes. By curtailing meat consumption and eating lots of vegetables they naturally have more circulating B vitamins and lower homocysteine levels.

So how much is enough? Many Americans have inadequate intake of these important nutrients. Dr. Stampfer and his colleague Dr. Malinow conclude that "perhaps 40 percent [of the population] is not consuming enough folate to keep homocysteine levels low." At least 400 mcg (micrograms) of folic acid a day are needed to stabilize homocysteine. At one time this amount was considered essential and represented the RDA (recommended daily allowance). In recent years, however, the RDA has been reduced to almost half that amount.

One can obtain enough folic acid and vitamin B<sub>6</sub> by eating at least five servings of fruits and vegetables a day. Leading nutritional experts maintain that such amounts would control homocysteine levels. We have provided a list of foods high in these nutrients. If you can't stand such foods, ask your doctor about supplements.

## TOO LOW CHOLESTEROL?

Everyone's heard, "You can't be too rich or too thin." Our cardiologist friend Ralph says, "You can't have too low a golf score or cholesterol level." He may be right about golf, but cholesterol is controversial.

Many researchers have been perplexed by a finding from numerous studies. While cholesterol-lowering strategies reduced the risk of heart attacks, there was no overall improvement in survival. This paradox was linked to an increased risk of suicide and violent or accidental death among the people whose cholesterol levels were lowest.

At first, researchers dismissed this result from large drug trials as a statistical fluke. But when it appeared repeatedly—though not consistently—they had to re-evaluate its significance. The puzzling association between low serum cholesterol and suicide was examined in a French study (Zureik et al, *BMJ* 1996; 313: 649-51). In this research, 6393 middle-aged working men were followed for an average of 17 years. Those with the lowest cholesterol concentrations (below 184) were three times more likely to kill themselves than those with average cholesterol levels. In another study, doctors found that women whose cholesterol levels dropped most dramatically after childbirth were more susceptible to postpartum depression (Ploekinger et al, *BMJ* 1996; 2313:664-679).

Scientists speculate that low cholesterol may alter mood or behavior. Cholesterol appears to be a component of nerve tissue and may also affect brain biochemicals. Preliminary research suggests reduced cholesterol may be linked to low blood levels of a neurotransmitter called serotonin. Reduced levels of serotonin appear related to depression, with a whole category of antidepressants (**Paxil**, **Prozac**, **Zoloft**, etc.) based on normalizing serotonin metabolism.

Stroke may be another potential risk of low cholesterol. Several studies indicate that men with total cholesterol below 150 or 160 are much more likely to experience a potentially lethal bleeding stroke. For those with high blood pressure *and* low cholesterol, the risk of death from cerebral hemorrhage is six times higher.

### ***A Drink to Your Health***

**I**f you like a glass of wine or two with dinner, your heart may benefit.

Researchers have found that moderate alcohol consumption can raise good HDL cholesterol. Studies have confirmed that people who have one or two drinks a day have less heart disease than teetotalers. Wine might explain the "French paradox." Although the French eat "forbidden foods" such as cheese, butter, and foie gras, their rates of death

from heart attack are the lowest in Europe and only half as high as ours.

While wine has received the most attention, there is evidence that beer and distilled spirits may also have a positive effect if consumed in moderation.

None of this means that someone who does not imbibe should take up alcohol. Heavy alcohol consumption carries serious health risks. And alcohol can interact dangerously with many medicines.

### ***Keep Moving***

**T**he next step may be, literally, first one foot and then the other.

Exercise can help improve the overall cholesterol picture. Not only can it help keep weight under control, but HDL levels tend to go up with regular physical activity. And don't feel that you have to set any records running. Vigorous walking is great. Tennis is terrific. Swimming and biking are also excellent activities and they have the added bonus of not injuring tender joints. If you monitor your cholesterol levels you should be pleased with the results regular exercise will bring.

### ***Do-It-Yourself Cholesterol Testing?***

Would you like to check your cholesterol as easily as you check your blood pressure? The FDA has approved do-it-yourself home cholesterol tests. Just prick your finger, squeeze a drop of blood on the treated card, and read the chart. While this will give you an indication of one risk factor, please keep in mind that cholesterol alone is not the whole story. These OTC tests will not tell you about HDL or LDL cholesterol so you cannot calculate the all-important lipid ratios.

# Lipid-Lowering Drugs

## ***Psyllium Laxatives***

When diet and exercise don't do the trick, it's time to consider drug treatment to get cholesterol levels under control. Perhaps the easiest and cheapest approach to start with is psyllium—a soluble fiber derived from flax seeds and found in many popular laxatives, including Metamucil, Modane Bulk, Fiberall, Konsyl, Reguloid, Effersyllium, and Hydrocil Instant, as well as some house brands labeled as containing psyllium hydrophilic muciloid.

Research utilizing Metamucil brand psyllium has shown that this soluble fiber can reduce total cholesterol levels up to 15 percent, and there is no reason to believe

that the other brands, some of which are less expensive, would behave differently. One of our column readers recently wrote to us about her experience: "I started taking a psyllium preparation after reading your column. In a matter of months my cholesterol went from 268 to 207. So I definitely am sold on it, and my doctor approves wholeheartedly."

The dose for lowering blood lipids is the same as that for laxative action. As with any fiber, though, it is very important to get adequate fluids.

## ***Fish Oil— Omega-3 Fatty Acids***

*New England Journal of  
Medicine* April 11, 2002  
*JAMA* April 10, 2002  
*Circulation* April 8, 2002

For more information on fish oil, we suggest *The Omega Rx Zone*, by Barry Sears, Ph.D. (HarperCollins, 2002)

Another over-the-counter approach to cholesterol control is fish oil. Many studies suggest that the omega-3 fatty acids in fish oil can lower triglycerides and dangerous LDL cholesterol. There is evidence that fish oil retards the build-up of atherosclerotic plaque inside coronary arteries. Several studies demonstrate that people who get more fish oil are much less likely to develop heart disease or die of a heart attack.

Researchers believe that omega-3 fatty acids can stabilize the electrical activity of the heart. These fatty acids also discourage blood clot formation and have anti-

inflammatory properties. Inflammation is now thought to play a crucial role in heart disease, as well as in many other chronic conditions, including Alzheimer's disease, arthritis, and lung disease.

The usual dose ranges from 1 to 3 grams daily. There is concern about the safety of fish oil at high levels, particularly if it is taken by someone who is also on blood-thinning medication or aspirin. For these individuals, there may be an increased risk of bleeding. That's why medical supervision is advised.

## ***Niacin***

Niacin is not a new drug in the fight against cholesterol. Doctors have known for decades that this vitamin, also called nicotinic acid, can lower blood fats. One advantage is that niacin tends to reduce triglycerides and LDL as well as total cholesterol, and to increase beneficial HDL by as much as 20 percent. Niacin appears to have a long-lasting impact on heart attack risk, bringing it down even years after people stop taking the drug.

For make no mistake: at the doses required to bring cholesterol under control, niacin is a drug rather than a simple vitamin. The niacinamide provided in many multiple vitamin supplements will have no impact on cholesterol,

by the way. To get results requires up to 3 grams (3,000 milligrams) of nicotinic acid daily. This should definitely not be taken all at once, but rather in three or more doses throughout the day. It is also possible that lower doses, perhaps no more than 1,000 milligrams, may be helpful for some people, especially those who are conscientious about diet and exercise.

These doses are far above the 12 to 20 milligram recommended dietary allowance for this B vitamin. Most people taking enough niacin to lower lipid levels will experience some uncomfortable side effects, especially

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at first. Tingling, flushing and itching are common. The feeling of warmth and the red appearance of the face and neck can be alarming, but are not dangerous. To minimize this problem, it helps to take the nicotinic acid with meals or in timed-release formulations, though they can increase liver toxicity. One aspirin tablet half an hour before swallowing the niacin may reduce flushing.

Large doses of niacin may also produce digestive tract distress, headache, and

dryness of eyes or skin. More serious side effects, although rare, include liver disturbances, blood sugar changes, and elevated uric acid, so it's probably not appropriate for anyone with ulcers, diabetes, liver abnormalities or glaucoma. In fact, even though niacin can be purchased without a prescription, this is not a do-it-yourself project. A physician should monitor the patient's progress on this medication.

## ***Colestid*** ***LoCHOLEST*** ***Questran Light*** ***WelChol***

Cholestyramine (LoCholest, Questran), Colestid and WelChol act in the same way. They prevent the reabsorption of cholesterol from the digestive tract, so the body gets rid of it more effectively. Questran can lower bad LDL cholesterol almost 13 percent and has a proven ability to reduce the risk of heart attack. In a major study of Colestid in combination with niacin, the average drop in LDL was an impressive 43 percent, and the degree of atherosclerosis clogging the

arteries was diminished.

Side effects may include constipation and other digestive tract problems, including pain, bloating, belching, hemorrhoids, heartburn, or nausea. These drugs may also interfere with the absorption of other medications and with fat-soluble vitamins such as A, D, E and K. Vitamin K-deficient individuals develop bleeding tendencies. Notify the doctor of any unusual bleeding.

## ***Lopid*** ***Tricor***

Lopid (gemfibrozil) is not often prescribed, though it brings all the bad guys—total cholesterol, triglycerides, and LDL—down while it raises HDL. A long-term Finnish study showed that men taking this anti-cholesterol medication reduced their rate of heart disease by 34 percent. Tricor is newer, but in the same category.

People taking either drug may experience nausea, vomiting, constipation or stomach pain, although these effects may

fade after several months or so. People on Lopid or Tricor are slightly more susceptible to gallstones. These cholesterol drugs can interact with anticoagulant medications such as Coumadin. Close monitoring is essential so that those taking both kinds of drugs don't experience a serious bleeding problem. Serious reactions to statins are more common in combination with Lopid or Tricor.

## ***Mevacor***

Mevacor (lovastatin) works to decrease the amount of cholesterol the body can make, and lowers LDL and total cholesterol dramatically—as much as 40 percent in some patients with hereditary high blood lipids—while it leaves the good HDL unchanged or brings it up slightly. It's no wonder many doctors see this drug as a star that may prevent "tens of thousands of heart attacks a year," as Yale cardiologist Robert Stark predicts.

Another advantage to Mevacor is that relatively few people experience troublesome reactions to it. Flatulence, diarrhea, headache, insomnia and rash have been

reported, however, and little is known about long-term side effects. Changes in liver enzymes have been reported; blood tests should be used to monitor them. Other rare but potentially dangerous consequences of Mevacor include muscle breakdown and kidney failure. Taking Lopid, niacin, erythromycin or cyclosporine at the same time increases the risk of this problem. Muscle pain or weakness are symptoms. Periodic eye exams are also advised, although early warnings that Mevacor might provoke cataracts appear unfounded.

**Lescol**  
**Lipitor**  
**Pravachol**  
**Zocor**

## Cholesterol-Lowering Drugs and Cancer?

## Blood Pressure Medicines Compatible with Lowering Cholesterol

Brand Name	Generic Name
Accupril	quinapril
Adalat	nifedipine
Altace	ramipril
Apresoline	hydralazine
Atacand	candesartan
Avapro	irbesartan
Calan	verapamil
Capoten	captopril
Cardizem	diltiazem
Catapres	clonidine
Cozaar	losartan
Diovan	valsartan
DynaCirc	isradipine
Isoptin	verapamil
Lotensin	benazepril
Lozol	indapamide
Mavik	trandolapril
Minipress	prazosin
Monopril	fosinopril
Normodyne	labetalol
Norvasc	amlodipine
Plendil	felodipine
Prinivil	lisinopril
Procardia	nifedipine
Sectral	acebutolol
Tenex	guanfacine
Trandate	labetalol
Univasc	moexipril
Vasotec	enalapril
Visken	pindolol
Wytensin	guanabenz
Zestril	lisinopril

Zocor (simvastatin), Lipitor (atorvastatin), Pravachol (pravastatin) and Lescol (fluvastatin) are newer cholesterol-lowering medicines. Like Mevacor, they block a key enzyme responsible for production of cholesterol in the liver. These drugs are very good at reducing dangerous LDL, triglycerides and total cholesterol.

All of these medications offer once-a-day

convenience. Like Mevacor, they can raise liver enzymes. The physician will need to monitor liver function with periodic blood tests. Other potential side effects include headache, constipation, diarrhea or rash. Muscle degeneration and kidney failure are rare but serious reactions. Report muscle pain, weakness or memory problems.

Check the *PDR* (*Physicians' Desk Reference*) or the package insert for cholesterol-lowering drugs such as Mevacor, Zocor, Pravachol, Lipitor or Lopid and you will find reference to carcinogenicity studies. These drugs have been reported to produce tumors in animals. Although not all of these drugs produce the same effects, cancers of the liver, lung, stomach and thyroid have been detected in rodents.

Researchers don't know how to interpret this information. Drs. Newman and Hulley

(*JAMA*, Jan 3, 1996, pp. 55-60) have written that patients are exposed to doses of these drugs that are similar to doses that caused cancer in rodents. Whether these drugs pose a cancer threat to humans remains uncertain. Because people are expected to take such medications for decades, this issue should be investigated further so that doctors and patients can weigh the benefit of avoiding a heart attack against the possible risk of developing a tumor.

Many commonly prescribed drugs may raise blood cholesterol, and some also lower HDL. This could be counterproductive.

There is no way to predict if any of the medicines listed will raise an individual's

cholesterol. A slight elevation might not be significant. Have lipid levels checked before starting on a medicine and periodically thereafter to see if your cholesterol count is changing.

## Drugs with Negative Effects on Blood Lipids

### Blood Pressure Medicines

Blocadren	timolol
Coreg	carvedilol
Corgard	nadolol
Diuril	chlorthiazide
Dyazide	HCTZ*; triamterene
Enduron	methyclothiazide
Esidrix	HCTZ*
HydroDIURIL	HCTZ*
Hygroton	chlorthalidone
Hyzaar	losartan, HCTZ*
Inderal	propranolol
Kerlone	betaxolol
Levator	penbutolol
Lopressor	metoprolol
Marazide	benzthiazide
Maxzide	HCTZ*; triamterene
Metahydrin	trichlormethiazide
Moduretic	HCTZ*; amiloride
Naqua	trichlormethiazide
Oretic	HCTZ*
Prinzide	HCTZ*; lisinopril
Renese	polythiazide
Saluron	hydroflumethiazide
Tenormin	atenolol
Toprol XL	metoprolol
Vaseretic	HCTZ*; enalapril
Zaroxolyn	metolazone
Zestoretic	HCTZ*; lisinopril

### Other Medications

Accutane	isotretinoin
Aciphex	rabeprazole
AndroGel	testosterone
Android	methyltestosterone
Brevicon	norethindrone; EE**
Cipro	ciprofloxacin
Danocrine	danazol
Effexor	venlafaxine
Levlen	levonorgestrel; EE**
Loestrin	norethindrone; EE**
Lo/Ovral	norgestrel; EE**
Lupron	leuprolide
Metandren	methyltestosterone
Micronor	norethindrone
Nordette	levonorgestrel; EE**
Norlestrin	norethindrone; EE**
Norlutate	norethindrone
Norlutin	norethindrone
Norpace	disopyramide
Nor-Q.D.	norethindrone
Ortho-Novum	norethindrone; EE**
Ovral	norgestrel; EE**
Ovrette	norgestrel
Prevacid	lansoprazole
Prozac	fluoxetine (rare)
Sandimmune	cyclosporine
Sarafem	fluoxetine (rare)
Tegison	etretinate
Tegretol	carbamazepine (rare)
Tri-Levlen	levonorgestrel; EE**
Triphasil	norethindrone; EE**

HCTZ\*=hydrochlorothiazide EE\*\*=ethinyl estradiol