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The Cholesterol Conundrum Continues

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Between 1995 and 2010, "favorable trends" were seen in cholesterol levels. Total and low-density lipoprotein (LDL, so-called "bad") cholesterol were lower as were triglycerides. High-density lipoprotein (HDL, so-called "good") cholesterol was higher. One reason is the prevalence of cholesterol-lowering drugs like statins. Prescriptions for such drugs soared during the past 15 years—260 million prescriptions were dispensed in the US during 2011. We're told all this is good, but the evidence begs to differ. [1]

Controversy. During the past decade, more changes (with disagreements) have been made in number 'goals:'

	Then (mg/dl)	Changed to	Changed again
Total cholesterol	< (less than) 240	<200	
LDL	< (less than) 130	<100 (2002)	< 70 (2004)
HDL	> (more than) 35	> 40	
Triglycerides	< (less than) 150	<130	

University of Michigan scientists concluded that the new levels for cholesterol have no scientific validity but are "perhaps arbitrary." Scientific opinions **differ** on cholesterol issues or there is contrary **evidence** to theories:

- Cholesterol levels outside the 'goals' increase risk for cardiovascular disease. Versus: At least **half** of all heart attacks and strokes occur in people with "desirable cholesterol levels."
- LDL/HDL **ratio** is a "valuable and standard tool" to evaluate cardiovascular risk. Versus: Individual levels of cholesterol, LDL and HDL "are more important than the ratio."
- **New** lipid measures—lipoprotein(a) or (b), apolipoproteins, remnant-like particle cholesterol, lipoprotein-associated phospholipase A_2, etc.—may improve mathematical accuracy. Versus: It's not known which, if any, of these additional components are important, what is normal, how to use the values in practice, or whether improving the numbers reduces risk for heart disease, stroke, or anything else.
- **Oxidized** LDL rather than LDL per se is the problem. Versus: While oxidized LDL is found in the plaque of damaged arteries, it's less likely a cause than an **effect**. Damage to an artery lining comes before the immune response that results in plaque buildup there. Blaming LDL is like blaming a scab for the injury that caused it to form. Deficits of nutrients (vitamins A, C and E, glutathione, etc.) that prevent premature breakdown of fats and/or consumption of altered or fake fats increase LDL oxidation.
- **Smaller**, dense LDL particles increase risk compared to larger 'fluffy' ones (which "may be relatively benign"). Larger is also better for HDL particles—they're better at removing cholesterol from blood and artery walls. Versus: It's not yet known if size and density are vital. Saturated fats tend to raise levels of **large** LDL particles, "suggesting that saturated fat may not be as bad as was once thought."
- Eating fats is detrimental. Versus: Fats have not been proved to be culprits. People placed on a high-fat diet (50% of calories) had increases in "good" HDL but no increases in LDL beyond the levels they had on their regular diets. Actually, "blood lipid responses to the manipulation of dietary fat vary significantly between persons." Each person's response reflects his/her present needs.
- Eating cholesterol-containing **foods** increases blood cholesterol levels. Versus: Eating foods containing cholesterol usually doesn't raise cholesterol levels much or at all, but only occasionally may increase levels. A rise in cholesterol is not necessarily bad as it indicates the body is doing work that requires cholesterol. Research hasn't shown a clear relationship between dietary cholesterol and heart disease.
- Boosting **HDL** is the most important strategy for preventing cardiovascular disease. Low HDL reduces the benefit of reducing "bad" LDL. Versus: HDL concentrations don't predict cardiovascular or any other risk. Low HDL levels "do not cause" heart attacks. People with normal HDL levels can still be at risk.
- Some people with high **HDL** and/or high **LDL** have heart attacks; others have heart attacks with low LDL and/or low HDL. Too-low LDL is linked to anxiety, depression, cancer, and other problems. LDL is the body's early-warning system, says Steve Riechman, MD, indicating something is wrong and needs to be healed. "If you did get rid of all your LDL cholesterol, you would die." [2]

Cholesterol's functions. LDL and HDL are lipoproteins—fats combined with proteins. Since fats and watery blood don't mix well, fatty substances must be shuttled to and from tissues and cells using proteins. LDL and HDL are proteins that carry cholesterol. "There is only one cholesterol," says Ron Rosedale, MD. "There is no such thing as 'good' or 'bad' cholesterol." The liver, brain and other cells produce cholesterol for good reasons:

- It is converted by enzymes into steroid hormones (estrogens, progesterone, testosterone, aldosterone, cortisol, etc. Corticosteroids regulate sugar, fat, and protein metabolism.
- It is the precursor to bile acids, needed for digestion and absorption of fatty acids and fat-soluble vitamins (A, D, E and K) without which we cannot live.
- It makes up a major part of membranes that surround cells and structures within them.
- The brain contains about 25% of all the cholesterol in our bodies. Myelin sheath that coats and protects nerve cells and fibers is about 20% cholesterol. Communication between nerve/brain cells (synapses) depends on cholesterol.
- The developing brain and eyes of the fetus and newborn infant require large amounts of cholesterol. Breast milk provides a lot of cholesterol and an enzyme to allow almost 100% digestion by the baby.
- Strength, energy, appetite, vitality and gaining muscle mass depend in part on cholesterol.
- Cholesterol is needed for the immune system to properly function, preventing damage to tissues and participating in repair processes. Cholesterol is **essential** to life.

About 80-90% of cholesterol is produced in the body—the rest comes from food. When you eat more cholesterol in your diet, your body makes less. When you eat less, your body makes more. Any excess is excreted. Levels increase in winter and decrease in summer. There are fluctuations depending on time, weather, exposure to toxins, and whatever is going on in your life. Levels elevate when your body is dealing with any injury, inflammation process, or stress (physical or mental). Cholesterol increases during and after a heart attack or any other traumatic event. A woman's cholesterol levels can vary as much as 20% depending on what phase of her menstrual cycle she is in. Average levels are highest in women during their peri- and early-menopausal years. An underactive thyroid usually results in high cholesterol levels. Obesity, insulin resistance or diabetes will produce high cholesterol (and triglycerides). A cholesterol level too low increases risk for depression, sleep problems, aggression, violent behavior, loss of memory, poor cognition, various types of cancer, Parkinson's disease, poor immune function, increased mortality, and more.

As a repair agent, cholesterol's levels increase whenever there is insult, injury or other need for healing. Some blood vessel areas receive more pressure and turbulence from blood flow than other areas. Plasticizers, lead, stain- or water-repellants, dioxins and other toxic chemicals damage blood vessel linings or walls. Nonfoods such as refined sugars, trans fats, and others can harm blood vessels. Deficiencies of needed nutrients weaken, constrict and stiffen blood vessels. An ongoing disease or something regularly causing damage can result in chronically high blood cholesterol levels. When any area is damaged or stressed, the liver dispatches LDL to the site to help make a 'patch' and help replace damaged cells. When LDL particles are spent or finished, they're transported back to the liver by HDL where they're broken down and excreted from the body. The rationale should be to discover what is insulting, damaging or stressing the body, requiring extra cholesterol. Forcing levels down with a drug or synthetic/isolated nutrients won't alleviate the cause—this actually interferes with repair the body is trying to accomplish. It's better to reduce the **need** for more cholesterol rather than suppress it and decrease the body's capacity to heal. Real nutritional food complexes and herbs help reduce cholesterol elevations by aiding repair, bolstering cellular function, helping to get rid of damaging agents. Then less cholesterol is needed and levels go down. People who experience periods of acute inflammation (as in rheumatoid arthritis, lupus, or other diseases) do better if they have **higher** cholesterol levels. Those with low cholesterol levels are almost twice as likely to die of heart failure. Andrew Clark, MD, says: "In contrast to what you might imagine, having a high level of cholesterol might be good for you." Cholesterol levels may be higher when the immune system is working through any inflammation process to attempt repair. Cholesterol-lowering drugs suppress inflammation, interfering with the body's efforts to resolve damage. Ronald Kraus is a member of the committee that writes the dietary guidelines for this country. His research indicates that total cholesterol and LDL are **not** linked with heart attacks. (He did find a correlation with a specific small dense type of LDL, but it subsided with increased consumption of saturated fat.) Most of the other members of the committee disagree and vote to recommend the opposite. Is that science? A number of studies found **no** connection between saturated fat intake and cardiovascular disease. Although cholesterol

levels are higher in North Americans than in Japanese, both populations have the same level of atherosclerosis. The cholesterol hypothesis "is like religion for some people," says Harlan Krumholz, a cardiologist at Yale University. He and others say that the cholesterol story is turning out to be messier and more nuanced than previously believed. Scientists are recognizing that HDL and LDL are not well understood. Some are asking whether HDL is even relevant to heart-disease risk. Good studies are finding that lowering LDL does not prevent heart disease. People with 'good' cholesterol levels have heart attacks. [3]

Statins. These cholesterol-lowering drugs (Lipitor, Mevacor, Zocor, Lescor, Crestor, Advicor, Pravachol) are being prescribed for more people than any other drug type. Some study reports sing the praises of statins for their benefits and safety. Yet virtually **all** major studies on statins were paid for or conducted by pharmaceutical companies or written by scientists with financial ties to pharmaceutical companies producing the drugs. Statistical results are often presented in **misleading** ways such as reporting relative risk reduction rather than absolute risk reduction. For instance, an ad boasting that Lipitor reduces heart attacks by 36% (relative risk) has, at the bottom in tiny print the more accurate absolute risk: "That means in a large clinical study, 3% of patients taking a sugar pill or placebo had a heart attack compared to 2% of patients taking Lipitor." For every 100 people who took the drug for 3.3 years, 3 people on placebos and 2 people on Lipitor had heart attacks. So, 100 people have to take the drug for more than 3 years to prevent 1 heart attack. The other 99 increase their risk of side effects for nothing. Also, researchers often combine major cardio-vascular events into a 'composite outcome measure' that yields the most statistical power possible. This impacts the interpretation of data, but when the numbers are scrutinized, there are **no** great benefits. Data from one study show that 1000 people would have to be treated with statins for one year to reduce the number of deaths from 9 to 8.

Many scientists challenge the questionable data and unfounded claims. Statins don't lower LDL in 40% of people taking them and "statins are not safe for all patients." Some clinical trials showed slightly lower heart disease death rates among those taking statins, but the benefit was offset by a higher rate of deaths from other causes. Any reduction in heart disease mortality is, as Uffe Ravnskov, MD, PhD, puts it, "unimpressive." Researchers ask why "the claims of benefit attributed to statin therapy in the primary prevention setting tend to be inferred from less-than-robust subset analyses or meta-analyses of clinical trials?" Real proof of benefit is lacking. Statins inhibit a liver enzyme that makes cholesterol and "poisons" everything the enzyme makes such as halting production of Coenzyme Q10 (CoQ10) and squalene. A CoQ10 deficiency can result in depression, hair loss, fatigue, cardiomyopathy, congestive heart failure, coronary artery disease, gum disease, loose teeth and more. CoQ10 supplements reduce stain-related muscle symptoms. Here are some statin **side effects**:

- Liver damage (statins inhibit production of cholesterol by the liver)
- Muscle weakness, aches and damage; severe with higher statin doses.
- Tendonitis and tendon tears.
- Increased fatigue after exertion; decline in overall energy.
- Memory and cognition impairment; transient global amnesia.
- Potential for depression, irritability, aggressiveness.
- Damage to peripheral nerves, causing peripheral neuropathy if statins are taken longer than 2 years.
- Lowered immune system function.
- Potential increase in autoimmune diseases and cancer risk (impaired antitumor immune responses).
- Increased risk for hemorrhagic stroke.
- Increase in prevalence and extent of coronary artery and aortic artery calcification.
- Abdominal pain and diarrhea.
- Increased risk for type 2 diabetes; deterioration of blood sugar control in existing diabetics.
- Worsened progression and symptoms of knee osteoarthritis.
- Increased risk of developing cataracts.
- Sexual dysfunction.
- Reduced fat metabolism including that of essential fatty acids. May suppress omega-3 benefits.
- Reduction in levels of CoQ10, vitamins A, D, E and K and carotenes.
- May deplete mineral-protein complexes including zinc, copper, selenium, and chromium.
- Lactic acidosis; anemia.

Most studies on statins have a high drop-out rate—many people drop out because of side effects. The FDA now requires that statins carry warning labels because of the many serious adverse effects.

Clinical trials of statins often find that reductions in cholesterol are not consistent with reductions in heart attacks. This led researchers to think that any ability of statins to reduce heart attacks and strokes has less to do with cholesterol reduction and more to do with plaque stability or anti-inflammatory effects. Yet lowering C-reactive protein (an inflammation marker) with statins doesn't change much. Actually, **higher** cholesterol levels protect against diseases involving lowered immune function. Edward Pickney, MD, cites 12 studies in which drugs were used to lower cholesterol; 8 of the studies were both randomized and blinded. In 6 out of 8, deaths were greater in the treatment group than in the control group. The other 4 showed no differences in death rates between the control group and the treatment group. People's cholesterol levels are lower nowadays, but for men aged 65 to 74, the rate of heart disease stayed about the same and for people of other ages, heart disease rates have increased. Statins don't reduce risks of dying from anything. [4]

Supplements. **Niacin** (a synthetic form of vitamin B_3) is taken in massive doses (1000 to 2000 mg/day) as a drug with potential side effects (flushing, itching, nausea, blurred vision, headache, slight increases in blood sugar, liver damage and more). Some sustained-release versions cause less flushing or less liver damage but have other adverse effects. A clinical trial in 2010 using a high-dose, extended-release niacin **and** a statin was stopped prematurely—there was a small, "unexplained" increase in ischemic strokes. Niacin raises HDL and lowers triglycerides better than statins, yet there doesn't seem to be much if any difference in reducing risks for heart attack and stroke. Niacinamide (the food form of B_3) does not cause flushing or other side effects and does not lower cholesterol like synthetic niacin—it's not a drug. **Red yeast rice** decreases total cholesterol by 13% and LDL by 19%. This fermented rice contains mevinolin which, when isolated from the mold *Aspergillus terreus* is a statin—lovastatin. It interferes with cholesterol synthesis and can cause the same side effects as the drug. But it doesn't appear to lower CoQ10 and may not damage muscle like statins, though elevations in liver enzymes and muscle pain do occasionally occur. Side effects include gastrointestinal discomfort, headaches and flulike symptoms. Red yeast rice may be safer, perhaps due to synergy with its phytochemicals. There are problems—it's not known how much lovastatin is in each batch and there is possible contamination with a mycotoxin toxic to the kidneys. Red yeast rice is used as a drug with potential for harm. It shouldn't be combined with other statins due to possible additive adverse effects. **Phytosterols**, fatty substances separated from plants, are esterified and placed in foods (e.g., margarine, milk, juice, cereal, yogurt, snack bars) or capsules to lower cholesterol. Sterols occur naturally in vegetables, fruit, legumes, nuts, seeds and grains; daily intake is 167 to 459 mg—not enough for "significant cholesterol-lowering." So sterols are given separately in huge daily doses—2000 mg to 3000 mg—to reduce LDL by about 9%. There are "strikingly" different responses to isolated phytosterols, partly depending upon the food (or nonfood) in which they are placed. They can reduce the bioavailability of carotenes and vitamins A, E and K. When real foods with **natural** phytosterol content are eaten, cholesterol levels may eventually be reduced **if** needed because nutrients and other food factors resolve the problem for which it became elevated in the first place. High doses (600 to 900 mg) of **pantothenic acid** (vitamin B_5) lower LDL and triglycerides. B_5 can be obtained from real foods (meats, whole grains, vegetables, etc.), but doesn't have the cholesterol-lowering drug effect of the separated and synthetic version. Isolated **anthocyanin** phytochemicals, vitamin **D_3 derivatives**, and isolated soy **isoflavones** may reduce total and LDL cholesterol and slightly increase HDL—other pharmacological products. **Alpha-tocopherol**, **ascorbic acid**, and **beta-carotene**—all separated and synthetic chemicals—may lower cholesterol but "do not protect against cardiovascular disease." Real foods and food complexes including vitamin **E** complex, vitamin **C** complex (with rutin and flavonoids), and **carotenoids** are protective, but not as drugs. They support the strength, integrity, flexibility and repair of blood vessel linings and walls, helping to lower the need for elevated cholesterol. **Selenium**, a component of vitamin E complex, in food such as nutritional yeast, aids in lowering cholesterol. Food **calcium** and vitamin D aid in lowering triglycerides and LDL, increasing HDL. **Probiotics** can reduce elevated cholesterol and LDL. **Fiber**—psyllium husks, chitosan (from crustacean shells), inulin, glucomannan, or beta glucan (from oats and barley)—may lower total and LDL cholesterol and raise HDL if needed. Stephanie Seneff, PhD, says that a deficiency of **cholesterol sulfate**—a water-soluble version synthesized in the skin and the precursor of vitamin D sulfate—may lead to defects in muscle metabolism, including the heart muscle. A 2008 study showed that "the sulfate ion attached to oxidized forms of cholesterol is highly protective against fatty streaks [in coronary arteries] and atherosclerosis." [5]

Herbs. Most products that have a fairly quick effect on cholesterol are isolated extracts from herbs used pharmacologically: Artichoke leaf extract inhibits cholesterol biosynthesis and LDL oxidation; 1200-1500 mg

per day is taken. Catechins extracted from green tea and taken in large doses reduce total cholesterol and LDL cholesterol. Isolated isoflavones from red clover may affect lipid profiles. Curcumin extracted from turmeric can lower cholesterol. Berberine—an alkaloid from plants such as goldenseal and Oregon grape—reduces total cholesterol, LDL and triglycerides while increasing HDL. Whole herbs such as garlic, ginger, cayenne Siberian ginseng, guggul, bergamot, and fenugreek can help balance cholesterol levels in time by supporting the underlying cause. Reishi mushroom can lower blood lipids and fatty deposits in the liver. Herbs that support liver function such as dandelion, burdock, and Oregon grape root aid the metabolism of cholesterol. [6]

Fats. Studies reporting a link between a high-fat diet and heart disease or stroke looked only at total fat consumption and ignored other factors such as how the fats/oils were processed and consumption of refined sugars and flours. Trans fats (partially hydrogenated vegetable oils) substantially raise cholesterol and LDL, for example. Commercially-fried foods and over-processed, refined vegetable oils elicit toxic effects and impact cholesterol levels. But natural, unaltered oils and fats do not affect the lipid profile. Emphasis is shifting from reducing the quantity of fats to improving the **quality** of fats. Evidence shows **no** strong association between intake of saturated fat and risk of heart disease or stroke. One study found that a diet rich in saturated fatty acids (SFAs) led to a lower or a steady state concentration of total and LDL cholesterol and an increase in HDL cholesterol. Similar effects were found in other trials with high or unrestricted intakes of SFAs. A meta-analysis of 21 studies with 347,000 participants found "no significant evidence for concluding that dietary saturated fat is associated with an increased risk of coronary heart disease or cardiovascular disease." Dr Ronald Krauss shows that studies indicating benefits from replacing saturated fat with unsaturated fats don't prove that saturated fat causes cardiovascular disease. Two meta-analyses of **all** controlled clinical trials in which the only intervention was a change in dietary fats found **no** effect on coronary or total mortality. For years we heard that eggs, beef, pork, seafood, whole-fat milk products, and other cholesterol- or saturated-fat-containing foods were deadly. Recent studies show that eggs, beef, pork and other meats (except commercially processed meats containing chemical toxins), seafood, natural cheeses and other previously forbidden foods **don't** cause problems and can be beneficial. "The theory that fat and cholesterol cause heart disease became widely accepted despite much evidence to the contrary," writes Stephen T Sinatra, MD. "The number one dietary contributor to heart disease" is refined sugar. People should reduce or eliminate refined sugars and other refined carbohydrates. Refined sugars create effects that damage blood vessel walls, increase LDL and triglycerides plus lower HDL. A low refined-carbohydrate diet that doesn't limit fat and includes whole grains, vegetables, fruits, fish, poultry, pasture-fed meats, nuts, and unaltered fats improves blood lipids better than a low-fat diet. **Omega-3** fatty acids, when isolated, don't seem to have much benefit. For example, in one study DHA (docosahexaenoic acid) by itself raised LDL; EPA (eiicosapentaenoic acid) alone had almost no effect on LDL. But food sources (such as cod liver oil, fatty fish) show definite benefits. Conjugated linoleic acid, alpha-linolenic acid, and gamma-linolenic acid are among other fatty acids in foods that help balance blood lipids. [7]

Food and lifestyle. Elevated blood cholesterol is the result of the body producing more in response to a need (damage repair, cell formation, hormone production, etc.). Trans fats, refined and over-processed oils, fried foods, refined grains, refined sugars, artificial sweeteners, industrial meats (with imbalanced fatty acids), and other items common to the Western diet can cause levels of total and LDL cholesterol to rise and HDL to sink because they stress and injure tissues. Drugs and drug-like substances lower cholesterol by interfering with the body's production, absorption, or use of cholesterol. Conversely, nutrients and other components of real foods improve or help heal the metabolic derangements and don't cause further damage or disruptions as do drugs. Then the body doesn't have to produce so much cholesterol or send so much to a needed area, resulting in lower blood levels. Consumption of healthful foods—vegetables, fruit, whole grains, nuts, seeds, legumes, unrefined oils, unaltered fats, 'clean' meats and poultry and eggs and seafood—balance cholesterol levels better than eating a low-fat diet or avoiding the accused saturated fats. A variety of fats, not just one type (such as the promoted monounsaturated fats) is important for needed nutrients, fat metabolism, and balanced lipid levels. Making dietary changes may not change blood tests quickly. Time for repair, healing, and restoring balance will differ among individuals depending on the damage, stress level, hormones, immune function, and other areas needing support. Healthful foods, food-concentrate supplements, regular physical activity, a low toxic load (including not smoking), and manageable stress make a healthful formula to support balanced cholesterol levels and avoid heart disease and stroke. [8] The following supplements may be considered to support liver function, fat metabolism, and balanced fatty acids:

Midway through two meals:
1 Hepatrophin PMG—break in mouth
1 Cholacol OR 2 Cholacol II
1 Cod Liver Oil

After Two Meals:
1 Cellular Vitality
1 Echinacea-C—break in mouth
1 Betafood—break in mouth

[1] MD Carroll, BK Kit, et al, *JAMA*, 17 Oct 2012, 308(15):1545-54; M Mitka, *JAMA*, 22/29 Aug 2012, 308(8):750-1.

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