

In cholesterol lowering, moderation kills

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■ ABSTRACT

The high-fat American diet is responsible for an epidemic of coronary artery disease. A plant-based diet with less than 10% fat will prevent coronary disease from developing, halt the progress of existing disease, and even reverse the disease in many patients. Given proper support and education, motivated patients with a history of coronary disease can follow this diet and prevent future cardiac events.

EVEN IF ALL AMERICANS kept their total cholesterol below 200 mg/dL, as recommended by the American Heart Association, millions would develop coronary artery disease.

Strong evidence from a wide variety of sources shows that total serum cholesterol levels must be kept below 150 mg/dL to stem America's epidemic of coronary artery disease. My own experience with heart disease patients shows that cholesterol levels can be kept below this threshold with a diet low in lipids and cholesterol-lowering medications as needed. This low-lipid therapy stops coronary disease from progressing and even reverses it.

Unfortunately, our national health and medical organizations continue to recommend a cholesterol threshold of 200 mg/dL and a diet containing up to 30% fat, despite clear evidence that this threshold is too high to prevent or cure heart disease. It is true that these recommendations have the potential to reduce the incidence of heart disease, but only by a moderate amount. Unfortunately, when

it comes to lowering cholesterol, moderation kills. With lower lipid levels, coronary artery disease need never exist. When it does exist, it need never progress.

■ A PLANT-BASED DIET FOR ADVANCED DISEASE

In 1985, I embarked on a program to help a group of patients with severe coronary artery disease. Most were debilitated by angina and other symptoms, and their angiograms showed severe stenoses. In some cases, disease was so advanced that standard interventional techniques such as bypass grafts or angioplasty could no longer be offered.

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These patients (1 woman and 23 men) agreed to adopt a plant-based diet with fats making up less than 10% of calories. They ate no oils, fish, meat, or dairy products (except skim milk and non-fat cheese and yogurt). The patients also took cholesterol-lowering medication as necessary to maintain their total serum cholesterol below 150 mg/dL.

Social and personal support was crucial for this group to learn about and follow the program, which was called arrest-and-reversal therapy. At enrollment, we discussed the treatment objectives in depth with both the patient and his or her spouse. For the first 5 years, the patients came to the clinic twice each month; visits were once a month during the second 5 years, and quarterly after that. On the evening of each clinic visit during the first year, the patient was telephoned to discuss his or her lipid results, diet, and medications.

Coronary artery disease need never exist

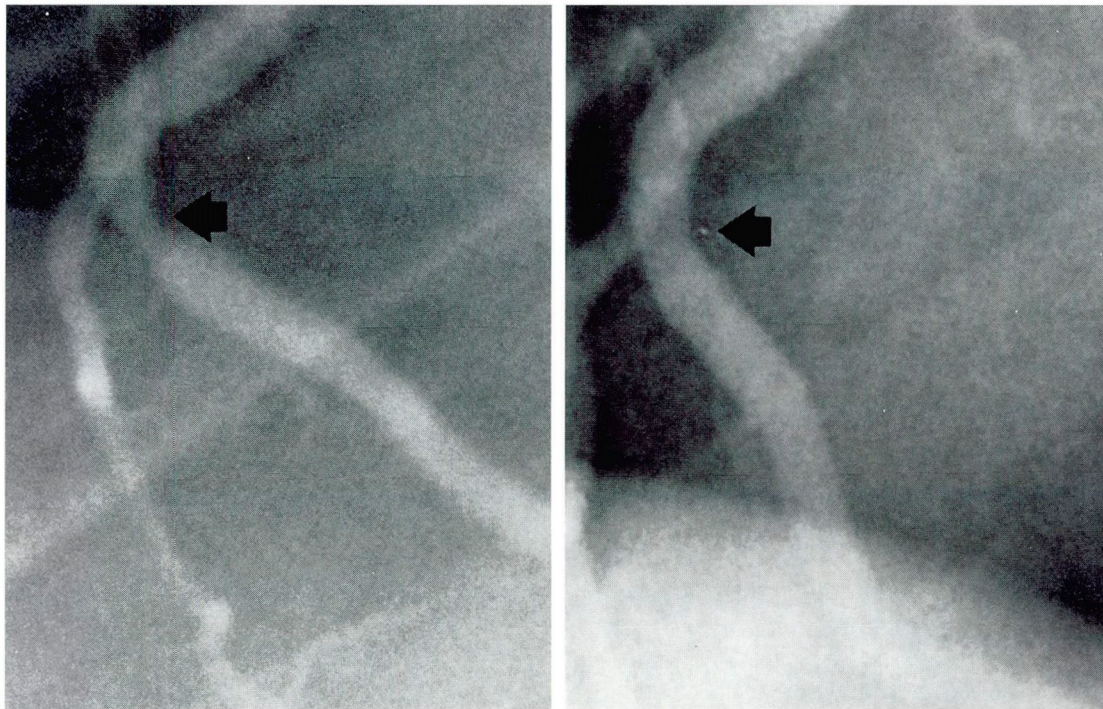


FIGURE 1. Left, the distal right coronary artery of a 54-year-old man at baseline shows severe stenosis (black arrow). Right, after 5 years of a low-fat diet and lipid-lowering drugs, the lesion has regressed by 30%.

FROM ESSELSTYN CB JR, ELLIS SG, MEDENDORP SV, ET AL. A STRATEGY TO ARREST AND REVERSE CORONARY ARTERY DISEASE: A 5-YEAR LONGITUDINAL STUDY OF A SINGLE PHYSICIAN'S PRACTICE. J FAM PRAC 1995; 41:560-568.

The patients also met several times a year as a group to discuss the program, share recipes, and socialize. I committed myself to the same diet, and patients reported that this was an additional source of support.

No relaxation or structured exercise regimens were included in the program. In my opinion, people have a limited number of lifestyle modification "credits"; if they spend all their credits by trying to change too many aspects of their lifestyle simultaneously, they may "go broke" and fail to change any of them.

■ AT 5 YEARS, HEART DISEASE WAS HALTED

Eighteen patients adhered to the diet and medications, bringing their mean cholesterol level from 237 mg/dL at baseline to 137 mg/dL at 5 years. None experienced any coronary events; in contrast, these 18 had had 49 events in the 8 years before the study. None underwent any interventions. All 11 of those who underwent angiography at 5 years had no

additional stenosis, and 8 had disease regression (FIGURE 1).

One patient died of ventricular arrhythmia just after his 5-year angiogram, but the angiogram showed that the disease had regressed and autopsy found no evidence of myocardial infarction.

Six nonadherent patients were released from the study within the first 18 months to return to standard care. Although their baseline levels of disease were similar to those of the adherent patients, these 6 patients suffered 13 new cardiac events after leaving the study.¹

■ AT 12 YEARS, THE BENEFITS CONTINUE

Today, the remaining 17 patients continue to follow the prescribed diet and medication schedules. At 12 years, their mean cholesterol level was 145 mg/dL. They experienced no disease progress or interventions. One left the study briefly but suffered a recurrence of severe angina and returned to the diet and medica-

Patients benefit most if lipids are lowered using both diet and drugs

tion after undergoing an elective bypass operation. The rest experienced no coronary events.² These results are important because they show that sharply reducing cholesterol levels is safe and that it stops coronary atherosclerosis rather than merely slowing it.

■ SUPPORT FROM OTHER RESEARCH

When our arrest-and-reversal study began, strong observational evidence already supported the benefits of low cholesterol levels. For example, 35% of the cases of ischemic heart disease found among the Framingham Heart Study cohort occurred among those with total serum cholesterol levels between 150 and 200 mg/dL. In contrast, few of those with levels below 150 mg/dL developed the disease, and none died of it.³ Atherosclerosis was already known to develop silently over many years of high-fat diets; autopsy studies of young, healthy men killed in the Korean and Vietnam conflicts found that many already had advanced atherosclerotic lesions.^{4,5}

More supporting data continued to pour in. For example, coronary artery disease is virtually unknown in populations that subsist primarily on grains, legumes, vegetables, and fruits, such as those in rural China.^{6,7} Normal adult cholesterol levels in these populations range from 90 to 150 mg/dL.

More than 10 years ago, Blankenhorn and colleagues showed that coronary artery disease can be halted or reversed by lowering lipid levels with medication.⁸ More recently, Dean Ornish and other investigators confirmed the benefits of a low-cholesterol diet. Their results showed that patients derived the most benefit if lipids are lowered by diet combined with medical therapy, rather than by diet alone or by modest diet changes combined with medication.⁹⁻¹¹

The AVERT study provides similar supporting evidence. The study showed that aggressive lipid-lowering medication is at least as effective as angioplasty plus standard care. However, the AVERT patients continued to eat a fairly standard diet, and 13% of them continued to experience cardiac events. This suggests that medication alone cannot confer the full benefit of lipid lowering.¹² A recent review of cholesterol-lowering studies

showed that the degree of benefit is related directly to how much cholesterol is reduced.¹³


■ LOW CHOLESTEROL ADDRESSES THE CAUSE OF THE DISEASE

Coronary artery bypass grafting, angioplasty, and other coronary interventions are directed at severe coronary stenoses. However, 85% of heart attacks are now known to be caused by rupture of smaller, unstable plaques, many of which are not even visible on angiography. Thus, costly “heroic” interventions do not reduce the risks of new heart attacks, slow disease progression, or even prolong survival for most patients.¹⁴

In contrast, lowering levels of total cholesterol and low-density lipoprotein (LDL) prevents coronary disease from starting or progressing. Lowering lipid levels also lowers concentrations of harmful foam cells within plaques and reduces the quantity of proteolytic enzymes. As a result, plaques may shrink, their caps stabilize, and they become much less likely to rupture.

■ AMERICA RESISTS LOWERING FAT

Despite the strong evidence in favor of reducing both dietary fat and serum cholesterol, Americans continue to increase their consumption of fat. Television and print advertisements aggressively push delicious, colorful, habituating, high-fat food. At our most memorable and emotional events—birthdays, weddings, funerals, and banquets—the food is even richer and more harmful than our everyday fare. Fad diets even promise weight loss and better health by *increasing* our consumption of fats and protein. It is clear that we live in a toxic food environment.

Unfortunately, the American Heart Association has failed to show strong leadership on this issue. If the coronary artery disease epidemic is seen as a raging fire, and cholesterol and fats are the fuels, the AHA has merely recommended cutting the flow of fuel. The only tenable solution is to cut off the fuel supply altogether—by reducing cholesterol levels to those proven to prevent and reverse coronary disease. 

Heroic interventions do not prolong survival for most patients

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LOW-FAT DIET

ESSELSTYN



REFERENCES

1. Esselstyn CB Jr, Ellis SG, Medendorp SV, et al. A strategy to arrest and reverse coronary artery disease: a 5-year longitudinal study of a single physician's practice. *J Fam Prac* 1995; 41:560-568.
2. Esselstyn CB, Jr. Updating a 12-year experience with arrest and reversal therapy for coronary heart disease: An overdue requiem for palliative cardiology. *Am J Cardiol* 1999; 84:339-341.
3. Castelli WP, Doyle JT, Gordon T, et al. HDL cholesterol and other lipids in coronary heart disease: the Cooperative Lipoprotein Phenotyping Study. *Circulation* 1977; 55:767-772.
4. Enos WF, Holmes RH, Beyer J. Coronary disease among United States soldiers killed in action in Korea. *JAMA* 1953; 152:1090-1093.
5. McNamara JJ, Molot MA, Strempel JF, et al. Coronary artery disease in combat casualties in Vietnam. *JAMA* 1971; 216:1185-1187.
6. Kesteloot H, Huang DX, Yang XS, et al. Serum lipids in the People's Republic of China. Comparison of western and eastern populations. *Arteriosclerosis* 1985; 5:427-433.
7. Campbell TC, Parpia B, Chen J. Diet, lifestyle and the etiology of coronary artery disease. The Cornell China Study. *Am J Cardiol* 1998; 82 (suppl):18T-21T.
8. Blankenhorn DH, Nessim HA, Johnson RL, et al. Beneficial effects of combined colestipol-niacin therapy on coronary atherosclerosis and coronary venous bypass grafts. *JAMA* 1987; 257:3233-3240.
9. Ornish D, Brown SE, Scherwitz LW, et al. Can lifestyle changes reverse coronary artery disease? The Lifestyle Heart Trial. *Lancet* 1990; 336:129-133.
10. Watts GF, Lewis B, Brunt JN, et al. Effects on coronary artery disease of lipid lowering diet, or diet plus cholestyramine, in the St. Thomas' Atherosclerotic Regression Study (STARS). *Lancet* 1992; 339:563-569.
11. Ornish D, Scherwitz LW, Billings JH, et al. Intensive lifestyle changes for reversal of coronary heart disease. *JAMA* 1998; 280:2001-2007.
12. Pitt B, Waters D, Brown WV, et al. Aggressive lipid-lowering therapy compared with angioplasty in stable coronary artery disease. Atorvastatin versus Revascularization Treatment Investigators. *N Engl J Med* 1999; 341:70-76.
13. Gould AL, Rossouw JE, Santanello NC, et al. Cholesterol reduction yields clinical benefit. A new look at old data. *Circulation* 1995; 91:2274-2282.
14. Forrester JS, Shah PK. Lipid lowering versus revascularization—an idea whose time for testing has come. *Circulation* 1997; 96:1360-1362.

COOKBOOKS FOR A LOW-FAT DIET

Ginsberg B, Milken M. *The Taste for Living Cookbook: Mike Milken's Favorite Recipes for Fighting Cancer*. New York; Time Life Books, 1998.

McDougall JA, McDougall MA. *The McDougall Quick & Easy Cookbook: Over 300 Delicious Low-Fat Recipes You Can Prepare in Fifteen Minutes or Less*. New York; Dutton, 1997.

Schlesinger S. *500 Fat-Free Recipes: A Complete Guide to Reducing the Fat in Your Diet: 500 Recipes from Soup to Dessert Containing One Gram of Fat or Less*. New York; Villard Books, 1994.

Siegel, Robert N. *Fat-free & Delicious: 176 fat-free & ultra low-fat recipes*. Pacifica (Calif); Pacifica Press, 1996.

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