



John Abramson, M.D.

INTERVIEW WITH  
JOHN ABRAMSON, M.D.

# 'Cholesterol Is Not a Health Marker'

*A physician and educator explains that the focus on cholesterol is driven by commercial interests, not health; it's where the money is to be made.*

**Question: From your research analysis, what do you see as the relationship of cholesterol to heart disease and overall mortality?**

Data from the Framingham Heart Study were published in 1993 in the *Archives of Internal Medicine*. They show that cholesterol is positively correlated with overall mortality through age 40. There is no relationship between cholesterol and overall mortality between ages 50 and 70, and there's a negative relationship between cholesterol and mortality at age 80. So the lower the cholesterol, the higher the mortality at age 80.

**Question: So, if we're talking about people over 50—**

Once people reach 50, there's not a correlation between overall mortality and cholesterol. There is a correlation between mortality from heart disease and cholesterol until people reach age 70, and then the relationship goes away.

**Question: So, there's a correlation between heart disease mortality and cholesterol up to age 70. . . .**

There's no evidence that cholesterol increases the overall risk of mortality, once age 50 is reached. And no evidence that cholesterol increases the risk of heart disease mortality, once age 70 is reached.

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*Dr. Abramson is a Clinical Instructor in Primary Care at Harvard Medical School, and the author of *Overdosed America: The Broken Promise of American Medicine*, published in September 2004 by HarperCollins.*

*He was interviewed by Managing Editor Marjorie Mazel Hecht, November 2004.*

**Question: But for the people in between, what do you tell them? What does this mean for the people in their 40s, 50s, and 60s, who are told that they need a cholesterol-lowering drug?**

There are two separate issues here. One is: What does the evidence show about the benefits of cholesterol lowering.

There is no evidence from randomized controlled studies, that lowering cholesterol with statin drugs is beneficial to women who don't have heart disease or diabetes. Similarly, there's no evidence from randomized controlled studies that lowering cholesterol for people over age 65, without heart disease or diabetes, is beneficial. But the 2001 Cholesterol Guidelines from the National Cholesterol Education Program, recommended an increase from 13 million to 36 million Americans taking statins. Most of that increase was for primary prevention. Most of those people don't have heart disease or diabetes.

**Question: How do you define heart disease, just to be clear?**

Having had a heart attack, or symptoms from blockage of the coronary arteries—angina.

**Question: So, if you haven't had a heart attack, and there's no evidence of blockage of your arteries . . . if you are a woman, there is no evidence that you get a benefit from cholesterol-lowering with statin drugs. And for men, what would you say?**

For men at elevated risk, there is evidence of benefit, of reduction of the risk of heart attack and cardiovascular mortality.

### Question: How do you define an elevated risk?

The original studies included in the WOSCOP<sup>1</sup> looked at men with LDL-cholesterol levels averaging 192.<sup>2</sup> They lived in Western Scotland, which has among the highest rates of heart disease in the world. And then the other study that was included in the 2001 guidelines was the AFCAS/TexCAPS study,<sup>3</sup> which looked at lowering cholesterol in a broader population with an average LDL level of 150. And the difference in the results of those two studies is telling. In the WOSCOP study, there was a 31 percent reduction in cardiovascular events and a 22 percent reduction in overall mortality, which just missed being statistically significant.

But in the AFCAPS study, the relative risk reduction in cardiovascular disease was 37 percent in the people who took the statin. But there was not a statistically significant reduction in cardiovascular mortality, and there were actually slightly more deaths overall in the people who took the statin than in the people who took the placebo. And the most important finding from this study is virtually unknown, which is, that there were equal numbers of serious illnesses in the people who took the statins and the people who took the placebo—serious illness being defined as something that causes hospitalization, death, or a new diagnosis of cancer.

So, in the AFCAPS study, it looks like you're trading cardiovascular diseases for other diseases, and not improving overall health.

The important issue here, is that if you go backwards, and apply the cholesterol guidelines for primary prevention, that were developed on the basis of the WOSCOP and AFCAPS studies, about 85 percent of the men in the AFCAPS study qualify for statins based on the guidelines that were made using that study. But when you look at the overall benefit, you see that you're not saving any lives, and it looks like you're simply trading cardiovascular disease for other disease.

### Question: So what did the statins do? Suppress the immune system?

We don't know. I wouldn't jump to a conclusion. I'd leave it a black box.

### Question: But there are so many black boxes in this whole area.

Exactly. That's what I've been doing for the last three years—trying to recalculate, and figure out whether the cholesterol recommendations are based on good evidence or not. And I think as a clinician, somebody who comes in, and who fits the WOSCOP study—say a man comes in with an LDL of 192, I can say to him, "Look, if I treat 100 men like you with a statin drug, in two years, I will prevent one heart attack, and in 5 1/2 years, I will prevent one death. So, do you want to take a statin?" And the person can make his decision, yes or no. I'm not saying it's a foregone conclusion. Many people would want to take the statin, and others would choose not to. As long as the person understands the risks and benefits, I would support either decision.

But if I say to a person with 150 LDL, "If I treat 100 people like yourself with a statin, in 2 1/2 years we'll prevent one cardiovascular event, but it will be replaced by another serious illness, and there is no reduction in your overall risk of mortality," I doubt that a lot of people would opt for the statin.

An additional problem is that the National Cholesterol Education Program focussed virtually all our attention on lowering cholesterol with drugs. Yet, we find out that exercise and diet are much more important in preventing heart disease and improving overall health. The important point is that when we talk about exercise, diet, not smoking, drinking in moderation, and maintaining a healthy body weight, those are very weak ways to lower cholesterol—they are not very effective at lowering cholesterol at all, but they are *very effective* ways to reduce our risk of heart disease, and to improve our overall health.

So, many people, even the most educated people and the best educated doctors, have been focussed so on cholesterol, that they think lifestyle changes are being recommended because they will lower cholesterol; but it's not lowering cholesterol that's the goal, it's improving health. And then when you go back to the original Framingham data, that we started the interview with, you see that cholesterol isn't the end-all and be-all.

In fact, there was a study published in the *Journal of the American Medical Association* about a month ago that looked at the results of following 7,300 women for 31 years, in Chicago, previously healthy women. It's like the Framingham Heart Study—women weren't included in the study if they had heart disease or major cardiogram changes. And it looked at the contribution of various risk factors to overall mortality:

blood pressure, diabetes, smoking, cholesterol, race, and minor cardiogram changes. The contribution of cholesterol to overall mortality for these women was 0.00.

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**"Probably about 80 percent about what doctors and patients believe to be true about medical care is coming from commercial sources."**

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**Question: So we have an area which people are very scared about, but which is a black box, still to me. We know certain things, but how do you explain this to the ordinary person? . . .**

Well, I think it's pretty simple, that the information that's coming at doctors and patients about cholesterol, is getting pushed forward primarily by commercial interests for its commercial value. It's not about improving our health.

**Question: It's pushing drugs—very high priced drugs. High priced and potentially dangerous drugs.**

**Question: So, what would you recommend for someone who has high cholesterol, and who is at risk for, or already has a heart condition?**

Let's separate the question: first, someone who has high cholesterol and is at risk for heart disease. In the new guidelines, that would be that they have two or more risk factors, that their chance of having heart disease in the next 10 years

is 10 to 20 percent, and their LDL-cholesterol is 130 and above, before July 2004 [when the new guidelines were adopted] or 100 or above after July 2004.

Let's separate it out for men and women, under and over 65. For women, there's no evidence that lowering their cholesterol with drugs is going to be beneficial. But there is very good evidence that exercising routinely, eating a healthy diet, not smoking, drinking in moderation, and maintaining a healthy body weight, reduces their risk of developing heart disease by 83 percent.

Now that's a headline, to me—an 83 percent reduction in risk of heart disease. Whereas the statin has zero percent reduction in heart disease. So, it's very clear to me what women should do.

For men who are at significant risk of heart disease, taking a statin may help to reduce the risk of heart disease, but it's very important to remember that each of the other lifestyle changes is probably more important than taking a statin, and combined, they are far more important.

For people over 65, who don't have heart disease or diabetes, we don't have significant evidence from randomized controlled studies that taking a statin drug decreases their risk of heart disease or their overall mortality rate. But we do have very good evidence—just recently a study published in *JAMA [Journal of the American Medical Association]*, showing that elderly folks who exercise routinely, eat a Mediterranean-style diet, don't smoke, and drink in moderation, have only 35 percent the mortality rate of people who don't do those things.

So, those lifestyle issues are very important for those elderly folks. But taking a statin drug, we don't have evidence [that it decreases mortality]. We do have evidence, however, that people 70 or older, who take a statin drug, develop significantly more cancer.

**Question: Why do you think there is such a difference between men and women under 65?**

Well, women have much lower rates of heart disease prior to menopause and in the years immediately following menopause. So there's probably something that's protective about women's hormonal environment, that we don't quite understand, that makes women's heart disease different from men, until they get into older age. And it's not simply the estrogens and progesterone, because the HERS study<sup>4</sup> showed us that even though hormone replacement therapy reduces "bad" cholesterol and improves "good" cholesterol, it doesn't reduce the risk of heart disease.

Cholesterol is given far too much weight as a health marker. And the disparity in the HERS study, really points it out: that lowering "bad" cholesterol and increasing "good" cholesterol, doesn't necessarily improve the risk of heart disease. It's more complicated than that.

Cholesterol levels are what we call a surrogate end point. They are not a health marker. They are not a health outcome. But because the money is to be made in getting people to believe that lowering cholesterol is the important health outcome, that's what patients and doctors have become focussed on.

A really important study is the Lyon Diet Heart study—a ran-

domized, controlled study—in which people who had heart attacks, were randomly assigned to eat a Mediterranean-style diet or a prudent post-heart-attack diet. The people who ate the Mediterranean diet had about a 70 percent reduction in their risk of heart disease, and about a 45 percent reduction in their death rate. So that's at least twice the benefit that we see patients, post-heart-attack treated with a statin (not that the two approaches can't be done at the same time). The important point here, is that the Mediterranean diet is very effective in preventing further heart disease and death, but it didn't lower people's cholesterol.

**Question: The accompanying article by the Ottobonis [page 45], discusses how the intake of cholesterol in foods doesn't have a direct relationship to your body's cholesterol.**

That's probably true, but type of food intake does have a big impact on your risk of heart disease.

**Question: Yes, they also say that.**

We've been sort of brainwashed into thinking that cholesterol is the most important health issue, but that's not true. That's where the money's to be made. . . .

The facts that we know are that Mediterranean diet works—and what about it works, I can't tell you. The jury is still out.

**Question: Can you comment on the practice of using statistical data to determine medical diagnosis and treatment, instead of the traditional practice of an individual physician looking at an individual patient, and looking at the patient as a whole?**

In the ideal, it would be a combination of the two. I think we have tipped way over into the biomedical model of medicine, where the unspoken underlying philosophy is that when we know more, the practice of medicine will be reduced to physics and chemistry.

**Question: Or computer relationships. . . .**

Yes, and that that will be good medicine. What is very clear to me, is that our health is 70 or 80 percent of the way we live our lives, and the environment that we live our lives in. And, as a physician, if I want to help people to make the changes that will be far more effective, overall, than medical interventions, then I need to have a relationship with people, and understand what their own sources of meaning, and their own values are, why they want to be healthy, to help them make changes that are sustained, that will have far more impact on their health than taking medicines.

What's happening, all the things that we've talked about so far, is that probably about 80 percent about what doctors and patients believe to be true about medical care, is coming from commercial sources. So that we mostly believe that it's the medical care that's going to protect our health, and not how we live our lives. Now, what that 80 percent does, is rely very heavily on statistics. And I think you have to look at two parts of the question you are asking. And on the downside of it, I'm in total agreement with you, that the person has to be—Sir William Osler, the first professor of medicine at Johns Hopkins, said it's more important to know what kind of

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very important: that there's been a radical transformation in the purpose for which medical knowledge is developed and communicated. And that happened really in the 1990s.

In 1980, academic researchers turned up their noses at drug company money. President Reagan came in. Small government. Economic downturn. NIH money for clinical studies shrank, and academics had to turn to drug company money to do their research. But in 1991, still 80 percent of that commercially sponsored research was being done in universities, so the university researchers still had control of the study design, the data, and publication.

But then there was a radical transformation that proceeded after 1991. So that when you get to 2000, only 34 percent of that commercially sponsored research is being done at universities. The rest has been pulled out to for-profit research companies. The pharmaceutical companies now play the major

person has a disease, than what kind of disease the person has.

**Question: I think there is another component that has come in, and that is the cost-cutting one, which is forcing some of these statistical changes and HMOs.**

But if you really wanted to cut costs, you'd go the other way.

**Question: What I'm saying is that that is what's being done, the computerization of medicine is used to cut costs. . . .**

But I think it's the relentless dialectic of the marketplace.

**Question: But the marketplace doesn't have a brain and doesn't make decisions. . . .**

It just moves toward making more money.

**Question: But it's the people who run it.**

The length of visits has not gone down during the HMO period. In fact, the length of visits has actually gone up a minute or two. I entered private practice in 1982, and exited in 2002, 20 years later. So I saw these changes go on. Do you think when doctors were running around and collecting fees from each examining room, that they went slower, than when the HMO told them what they had to do?

**Question: I think we had better medical care before the HMOs, put it that way.**

Well, yes, but you can't blame it on the HMOs. . . . I think that the HMOs are just along for the ride. It's the commercial intrusion, and the HMOs are a part of that. But it's the commercialization of medical knowledge that really underlies the whole thing. . . . There are HMO excesses, I'm not disagreeing with what you are saying, but I think what's changed here is

role in designing studies. Most of the authors of the articles that are drug-company sponsored, don't get to see all the data from their own studies. They are only looking at the data that's getting parcelled out to them by the drug companies.

**Question: That's a very disgusting situation, in terms of the health of the nation.**

It's huge, it's huge. So authors themselves are not seeing the data. They are submitting articles to journals when the drug companies let them. The drug companies are more likely to withhold from publication studies that won't help their sales. Then when you submit the articles to journals, even the best journals that are peer-reviewed, the peer reviewer doesn't get to see the data that the authors didn't get to see. So peer reviewers can't help us in this situation.

**Question: Isn't it only recently that authors are disclosing financial links to the drug industry?**

They've been disclosed, but that doesn't help at all. The situation we're in right now, is that about 80 percent of our clinical research is coming from the drug companies, and even among the best of that research, the research that's selected to be in the Cochrane reviews, the odds are five times greater that commercially sponsored research will favor the drugs, than non-commercially sponsored research.

**Question: So, really, we've lost our independent university-sponsored research capability in all this.**

Right. Now it's 34 percent. But it's not just that it's only 34 percent. Drummond Rennie, the deputy editor of JAMA, said in 1999, that the academic institutions are so desperately trying to get that research money back, that it's a "race to the ethical bottom" among academic institutions. So now, they have

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to compete with the standards that for-profit research companies have, or they won't even get their 34 percent.

So the bottom line is that the purpose for which medical knowledge is produced and disseminated is no longer to improve the health of the American people. It's a corporate investment, and it's designed and carried out and publicized with the idea of improving the corporate bottom line.

**Question: I think that's a good summary of the situation, in which to view all the things we've discussed. That's the thesis of your book.**

Yes. What I've done is to show how the magician does his tricks: How this happened, and how we believe that this is the right way to run a health care system. My book discusses how our health care system, which is spending \$1.8 trillion (\$500 billion of which is for unnecessary care, much of which is harmful to our health), how that can look to doctors and patients like the right way to practice medicine; that's really what the book is about.

**Question: Meanwhile, if you look at things like infant mortality, the United States is sinking in this area. And if you look at other kinds of standard markers, where the U.S. once had a very fine health care system, leading in the world, now we are 14th or less among the nations of the world.**

Out of 22 industrialized nations, we spend twice as much per capita, and we will live the shortest amount of time in good health.

**Question: Something is wrong!**

And infant mortality, which I go into in the book: the fact is that the concentration of neonatologists and neonatal beds for newborns, varies by a factor of four in the United States, with no

benefit, once you have the minimum level. And when you compare the United States to other countries, we have twice as much neonatal intensive care capacity, but even looking at equivalent birth-weight babies, that doesn't buy us better survival statistics. So, what we're doing is spending twice as much on neo-natal intensive care, but less on the upstream solutions of prenatal care and preconception care, that would decrease the epidemic we have of low-birth-weight babies in relationship to the rest of the industrial world. That's the real problem.

And the *New England Journal of Medicine* editorial that went along with Elliott Fisher's article describing the variation of neonatologists by a factor of four, pointed out that one of the problems is that the neonatologists are supplied by a for-profit company that's traded on the New York Stock Exchange, that hires neonatologists, and they turn a profit of \$50,000 per doctor that they hire! So, it's economically driven.

**Question: From their standpoint. . . .**

And from the hospital's standpoint. The hospital makes money on neo-natal beds. And what new mother is going say "no" to the doctor, when they say, "we think your baby would be safer if we transfer him to the intensive care unit"? Who's going to turn that down, and what HMO would dare turn that down?

There's a chapter in the book, "Follow the Money," that's about medical care being pushed into use by the financial incentives to the providers, rather than the health needs of the patients. The pressure comes from the business consequences to the suppliers of care.

**Question: Let me get back to cholesterol: Why is the NIH, NHLBI so afraid to have an independent review of the cholesterol issues you raised?**

Beats me. If I were head of the National Institutes of Health, I would say, "The question's been raised, there were financial conflicts, we believe in our data, therefore it's in everybody's interest to have guidelines that don't have a commercial shadow over them, so let's reevaluate them." That was not their response.

**Question: Their response was really just to reiterate what they said to begin with. . . .**

And to misinterpret what our argument was.

**Question: Do you think that most physicians go along with the Guidelines because they have never seen anything else, they've never seen the criticism of the Guidelines?**

Yes. And they have to, because they're at risk of getting sued if they don't. In other words: You come to me. Say you're a woman who has two risk factors for heart disease. Say you're over 55 and you have a low HDL. And I do the risk score, and the risk score comes out that there's a 10 to 20 percent risk of your developing heart disease over the next 10 years, and your LDL level is 105. According to the new guidelines, I should offer you the "therapeutic option"—that's their language; the new guidelines say that I should offer you the therapeutic option of a statin drug, right then at baseline, no longer tell you to go out and eat a good diet, etc.—right then, that I should offer you the therapeutic option of a statin. Now among women in that category, maybe there's going to be one heart attack out of—I'm going to make up a number—out of 1,000 women over the next few years. And if I have not offered that one out of a thousand women the therapeutic option of a statin, I can get sued. And the Guidelines are admissible in court as evidence.

Here's the important point: We were talking before about the challenge of physicians working in 15-minute time blocks to re-frame health for their patients as mostly determined by how they live their lives and the environment they are in, rather than prescribing medicines, and that is a challenge, that's true. But think how great the challenge if I'm a physician, and you come in, and I'm trying to explain to you that the Guidelines are over-reading the data—as I believe, and others believe—and that I'm going to explain to you the Guidelines, and explain to you the counter-argument, so that you can make an informed decision about whether or not you want to take a statin drug. That's a time burden. That's an obstacle that I think is sinful, and a distraction to good medical care and to doctor-patient relationships. That's why the subtitle of my book is "The Broken Promise of American Medicine."

**Question: It's a big problem; I understand that because many of my colleagues and friends are taking statin drugs, and they've been upset by what I have told them about cholesterol, because it challenges what they have been told by medical authorities. I think that the way the Ottobonis wrote their article is a good approach: They urge people to get more informed, and look at the evidence themselves.**

I wrote an op-ed piece that was published in the *Los Angeles Times*, after the Guidelines came out in July, summarizing my criticism. A hospital in the Los Angeles area invited me to speak on the issue. Most of the people in the room were

following me, but there was a mini-rebellion, from one or two guys, researchers, who couldn't stand it. And a professor from UCLA got up and said, "Look, I'm a guest here, but I've published hundreds of papers, and I know a lot about research, and what Dr. Abramson is telling you is so vanilla, in the middle of the road, just presenting the numbers that are in the studies that the Guidelines people are using. If I were presenting this information, I would be presenting a very different picture, which would be far more critical of the research upon which these guidelines are based."

So if we can somehow communicate this idea, that what I am telling you is totally middle-of-the-road. It is not biased, it is not overstated, it is just the studies that were used by the National Cholesterol Education Program. We're not even questioning the legitimacy of the studies (most of which were sponsored by drug companies) that were included in the Cholesterol Guidelines. I know a lot about the problems with the way that the Vioxx and Celebrex research data were misrepresented in JAMA and the *New England Journal of Medicine*. I haven't done that with the cholesterol studies. I'm just saying: "I'll take your studies at face value. You've misinterpreted them. You've misrepresented them."

**Question: Well, it's a very political issue, and an important issue, especially as people get older.**

Absolutely. It goes to the heart of a functioning democracy. Have you seen Philip Kitcher's book, *Science, Truth, and Democracy*? It's a philosophical book, but his argument is that at bottom, these are political issues. It's not science, but it's the political context in which science occurs. It's just like corporate behavior is politics.

**Question: Science is politics. . . and science should be truth. We aim for printing the truth, not what's popular opinion.**

Well, I think there's a philosophical problem with that, and here I'll paraphrase the doctor appointed by President Bush to be the head of his bioethics commission, Leon Kass, who I think makes a very important point, and I don't say this at all facetiously. He says that the kinds of truths that science can discover, are different from the kinds of truths that emanate from our values. And that we need to be clear about what our values are, if we are going to be able to use scientific truths in the service of humanity.

**Question: What is he talking about? People's religious values?**

In the context that we're talking, the moral question is, what do we think ought to be the function of the health care system? Ought it to be, to improve Americans' health most effectively and efficiently, or ought it to be to support a marketplace, whose product is health care?

**Question: I certainly go with the former. . . .**

I do too, but our current Administration seems more interested in the latter.

**Question: That's a real problem, with this Administration, but that is a whole other issue.**

I think that this question of values, of defining your values and knowing what your target is, is important. I think that one



Philip Ulanowsky/EIRNS

*"One of the biggest health care emergencies in the United States is the lack of universal health insurance. Eighteen thousand Americans die each year because they don't have health insurance."*

of the biggest health care emergencies in the United States, is the lack of universal health insurance. Eighteen thousand Americans die each year because they don't have health insurance. That's like a 9/11 every two months. I've got a paper coming out with a health policy colleague, called "When Health Policy Is the Problem." And what we are saying, is that health policy is in the way of solving this problem. If you believe that there should be universal health insurance, stop doing pilot projects, stop doing studies that show this and that, and implement universal health care.

That's our problem. We're not implementing universal health care. Seventy-nine percent of Americans think we should have universal health care, and they are willing to pay higher taxes to get it. These are the moral issues in the United States, not whether there should be gay marriage or not.

**Question: I agree. The economic issues are far more important, and the others were a diversion. . . .**

**One final question on cholesterol: How did you get involved with this issue?**

I was very fortunate to have the opportunity to do a two-year Robert Wood Johnson Fellowship, after finishing my residency in family medicine. During that time I studied epidemiology, research design, and health care delivery. I thought I was headed for a career in academic medicine—teaching in a family practice department in a university hospital. But watching my mentor work, I realized that family physicians in academic medical centers remain low doctors on the totem pole. Watching the difficulties he encountered on a daily basis, I decided that I could be most helpful by becoming a full-time clinician. So, I went into private practice. Toward the end of my 20 years in practice, I saw the commercial intrusion into the medical care that I was practicing, and that was being practiced on my patients by other doctors, growing exponentially.

I started to use the skills I had learned as a Robert Wood Johnson fellow, to research the research. The first major issue I sank my teeth into was Celebrex and Vioxx, and when I realized—this is in September 2001—how misleading the two articles about Vioxx in the *New England Journal of Medicine* were, and an article in the *American Medical Association Journal* about Celebrex, how they had misrepresented the data from the companies' own studies, I realized that we had crossed a line, where our most respected medical journals could no longer be trusted. I felt compelled to figure out how our medical knowledge was being corrupted by commercial influence and to tell the story—to patients and doctors.

So, I started to write a book documenting the extent and consequences of the commercial influence in our medical knowledge. I spent six months analyzing Celebrex and Vioxx data. The next thing I got into was the 2001 Cholesterol

Guidelines, and the deceptions in that. For example, they say that there's evidence that statins help women for primary prevention (without heart disease or diabetes), and they quote six studies. But none of the six studies provides significant evidence.

They say that there's evidence—they quote nine studies—that statins help people over 65 for primary prevention, but none of the nine studies provides evidence to support their comment. About 200 pages after the claim about women, they say, evidence for women is "generally lacking"—that's in the eighth section—and that their recommendations for women are based on the extrapolation of data from men.

**Question: Well, that's a big red flag.**

That's when I sunk my teeth into this issue, when I realized that the Guidelines were a partisan argument for using more drugs, instead of a dispassionate analysis of the science. You'll see in my book, which went to bed in March, after two and a half years of writing, that I anticipated the July update of the Guidelines, because I talk about the studies—the ALLHAT study, the PROSPER study, the ASCOT study—and I bring them into the book as evidence that the 2001 Guidelines were wrong, and these studies show how wrong they were. And then the National Cholesterol Education Program uses the same studies to add millions more Americans to those already taking statins.

#### Notes

1. "Prevention of Coronary Heart Disease with Pravastatin in Men with Hypercholesterolemia." *New England Journal of Medicine*, Vol. 333, pp. 1301-7 (1995).
2. LDL-cholesterol, commonly called "bad cholesterol," enters artery walls, causing plaque to build up that can block blood flow. HDL-cholesterol, commonly called "good cholesterol," can remove cholesterol from arterial walls, minimizing plaque formation.
3. "Primary Prevention of Acute Coronary Events with Lovastatin in Men and Women with Average Cholesterol Levels: Results of AFCAPS/TexCAPS." *Journal of the American Medical Association*, Vol. 279, pp. 1615-22 (1998).
4. HERS—the Heart and Estrogen/Progestosterone Replacement Study.