Introduction

Out with the old, in with the new

“I believe that you are suffering from what is called a fatty degeneration of the heart.”

Dr. Tertius Lydgate to Mr. Casaubon on making a diagnosis with the new medical device, the stethoscope.

George Elliot
Middlemarch, 1871

Old notions in medicine have a peculiar way of lingering.

In 1882, Dr. Robert Koch discovered the tubercle bacillus in tissues of people with “consumption.” By connecting a bacterium with the disease, he usurped the long held notion that tuberculosis was a degenerative disease caused by lack of fresh air. But, for decades after Dr. Koch’s revelation, the “bad air” notion persisted. Surgical collapse of the lung, a painful and barbaric treatment for tuberculosis, persisted well into the 1960s, years after effective antibiotics were discovered in 1947.

The medical community of the 19th century viewed mental illness as the hereditary end product of ancestral nervousness, alcoholism, prostitution and criminal behavior, a bias that remained entrenched well into the mid-20th century. Nazi physicians invoked the theory of heritable “mental degeneration” to justify wholesale extermination of schizophrenics. Electro-convulsive therapy (ECT, or “electroshock therapy”) was widely applied to treat schizophrenia, depression, homosexuality, and criminal behavior for over 30 years, gradually abandoned (at least in its original form) after years of abusive application to subdue patients,
demonized in the 1975 movie, “One Flew Over the Cuckoo’s Nest,” depicting the author’s real-life experience with ECT.

Long after a theory or practice has been discredited, it can persist, refusing to die. The new and improved may not be adopted into mainstream practice for years, even decades.

Back to the 21st century: What if you realized that, by quirks of human nature and the uneven adoption of health information, your doctor practiced medicine appropriate for 1985? 1975?

While digital information nowadays is transmitted at the speed of light, disseminating as fast as it takes the next juicy tidbit to be “virally” reproduced via social networking websites, it’s the human factor that still operates with the inertia of human behavior. Human habits and attitudes slow the adoption of new information to time measured not in seconds, but in years or decades.

A century ago, 20 years were required for the new technology of blood pressure measurement to be adopted after its introduction in the U.S. in 1910, since physicians were long comfortable with the practice of “pulse palpation” (feeling the pulse). (The arcane language of pulse palpation persists to this day, terms like “pulsus parvus et tardus,” the slow rising pulse of a stiff aortic valve; the “water-hammer” pulse of a leaking aortic valve.)

The discovery of new, health-changing information today in the 21st century disseminates through the ranks of modern healthcare providers at much the same pace as measuring blood pressure did in the early 20th century.

It’s also tempting to paint American medicine as a fiefdom intent on maintaining its exclusive rein over health information. Look back over the hierarchical relationship of medicine over nursing in the past century: When blood pressure measurement was adopted on a broad scale in the 1930s, it was practiced only by physicians, since nurses were deemed incapable. (Modern-day nurses would surely have a hearty laugh over this.) Stethoscopes, around even longer than blood pressure cuffs, weren’t permitted to fall into the hands of nurses until the 1960s, since the medical community feared that nurses might command too much control over patient care. Even after nurses were permitted to have their own stethoscopes, great pains were taken to be certain the nurses’ version was readily distinguishable from the “real” tool wielded by physicians; nurses’ stethoscopes were therefore labeled “nurse-o-scopes,” or “assistoscopes,” and were required to be smaller and flimsier.

Old and ineffective doesn’t always give way to new and better at once; it is slowed by habit as well as an unwillingness to relinquish control.
Somehow technology marches on. But it does so unevenly, sweeping some along in its first wave, others in its wake, some never at all.

Just as effective antibiotics to cure tuberculosis were available for 20 years while many surgeons continued to remove patients' lungs, so better solutions to heart disease are already available but not yet employed by your neighborhood physician. The primary care physician may have heard about some of the newest means to prevent heart disease, but is too overwhelmed with the day-to-day of sore throats, diarrhea, and rashes. Cardiologists, intent on inserting the next best stent or defibrillator, have little but passing interest in strategies that might halt or reverse the heart disease that can be “managed,” no matter how imperfectly, with procedural solutions like angioplasty and bypass surgery. We should bear these flawed human tendencies in mind as we explore the world of heart disease prevention.

We need look no farther than the front page of the newspaper to find evidence of the failure of present-day heart disease detection and management. Over the past several years, headlines have carried the likes of Tim Russert, Bill Clinton, Larry King, Dick Cheney, David Letterman, Tommy Lasorda, Ed Bradley, Mike Ditka, Walter Cronkite, Alberto Salazar, all heart disease sufferers. Some, like talk show host David Letterman, survived their brush with heart catastrophe and underwent successful bypass surgery. Others, like marathoners Fixx and Salazar, raised none of the conventional red flags for heart disease. All received standard, "modern" medical care . . . all the way up to their heart attack, bypass surgery, or untimely death.

Track Your Plaque represents an example of the new. But, unlike the simple practice of taking blood pressure in the early 20th century, Track Your Plaque represents an entirely new way to look at coronary heart disease: a new way to measure it, a new way to identify its causes, and a new way to seize control over it, often to the point of achieving reversal of the process. It also puts control over much of this process into your hands and away from hospitals, cardiologists, and heart procedures.

I could speak of revealing “secrets,” but that’s not true. In Track Your Plaque, I simply convey information about heart disease that you were likely unaware existed, strategies that doctors fail to discuss. I assemble them into a “package” that, together, create an enormously empowering unique approach to prevent heart disease and heart attack. Track Your Plaque also challenges the high-tech status quo, practices that occupy exalted places in the enormous cardiovascular healthcare machine that has developed in the U.S. over the past 40 years. I propose that high-tech hospital procedures should join the practice of ECT for homosexuality and insanity—another relic of the past.
Chapter 1

Taking the Guesswork Out of Heart Disease

Heart disease care today is all high-tech—except when it comes to predicting who will have it. Then it boils down to little more than an educated guess.

Guesswork will give way to better methods to detect it, followed by ways to track and control it. That’s what the Track Your Plaque program is all about.

It took my mother’s death to teach me about heart disease.

Up until 1995, I was consumed with performing the newest, cutting-edge angioplasty procedures, and I wanted to do as many of them as I could. It was an exciting time, ripe with new techniques, new devices, new concepts. Every day brought fresh challenges on how to cut, burn, drill, laser, and stent the coronary arteries of patients with heart attacks, unstable heart symptoms, diseased hearts.

My days typically began in the cardiac catheterization laboratory at 7 am, running late into the evening, 7 days a week. In that early era of interventional cardiology, many of the rules had not yet been written. I excitedly followed the lead of angioplasty heroes, like Dr. Geoff Hartzler of Kansas City and Dr. Gary Reuben of the University of Alabama, both at the forefront, extending the leading edge of how far we could go in the Wild West world of coronary “intervention.” The satisfaction and challenges were intoxicating.

In late summer, 1995, I received a phone call telling me that my mother had died—sudden cardiac death at age 62. She’d had an angioplasty several months earlier at a reputable heart center in New Jersey. I had discussed my mother’s case with her cardiologist and had felt satisfied that he seemed fully in touch with her health issues.

It took several weeks for the irony of my mother’s death to sink in. Perhaps I didn’t want to see what my mother’s death could teach me: _What I did professionally as a cardiologist was fundamentally and terribly flawed._
My mother’s death shattered my long-held conviction that I was delivering the best care to my patients. Years of training and practice, doing the same as thousands of my cardiology colleagues, but it took my mother’s death to help me see how misguided the conventional procedural approach to heart disease truly was.

I began to see that we tackled heart disease as “crisis management”: We waited for a crisis like heart attack to strike, then proceeded to “fix” it. We dealt daily in catastrophe but devoted little thought to why it happened in the first place. Managing crises also meant that many people never survived to take advantage of our help, like my unfortunate mother.

I therefore set out to find answers to several questions: How can coronary heart disease and risk for heart attack be identified years before catastrophe strikes? How can risk be reduced or eliminated with greater certainty than provided by crude measures like cholesterol? (My mother had been advised by her doctor that her cholesterol values were “fine.”) How can we measure and prove success? More recently, I’ve extended the challenge further: How can we achieve all this with minimal or no medication and achieve sufficiently confident results so that heart procedures are no longer necessary?

After several years of effort, I believe that a rational, effective, and scientifically-valid program is now available. I call it Track Your Plaque.

Once you read about these concepts, I believe that you will agree that the answers to my questions are really maddeningly simple. In fact, you may find that the answers to many of your questions about heart disease have been available all along, but you just didn’t know where to look. You may also be angered by your new appreciation for the misguided beliefs of people around you—perhaps including your doctor—who insist that heart attack is unpredictable, or inevitable, or that the only effective treatments are hospital procedures. Or that prevention of heart disease ends at following a “sensible” low-fat diet, statin cholesterol drugs, and exercise.

It’s all completely untrue.

“Doctor, will I have a heart attack?”

You walk into your family doctor’s office.

Your neighbor, exactly your age, just died from a heart attack—no warning, good health beforehand. In fact, you chatted with him just days before while he took a break from push-mowing his half acre lawn. He looked fine. Understandably shaken, you want to know whether you have heart disease, though you, too, feel fine. You press your doctor for an answer.
How does he/she answer your question? More than likely, it would go something like this:

1) “Do you have chest pains or excessive breathlessness?” he/she begins. You respond that you have no symptoms.
2) An examination follows. Everything is normal, with no physical sign of heart disease.
3) You get an EKG. The doctor declares that you’ve not had a heart attack and your heart rhythm is normal.
4) Your doctor checks your cholesterol values. Your cholesterol values are somewhat high: total cholesterol, 230 mg/dl, and LDL cholesterol, 150 mg/dl.
5) A stress test is performed. It’s completely normal.

You leave the office after receiving advice on cutting the saturated fat in your diet and plans to have cholesterol tests repeated in several months. After the entire process, you’d likely be satisfied with your doctor’s thoroughness. You’re convinced that you have no hidden heart disease and won’t fill the cemetery plot next to your neighbor.

But that’s not what decades of clinical science and experience show.

Nothing that your doctor did reliably detects hidden heart disease. You could have extensive silent heart disease or you might have none. You could drop over suddenly watching your favorite reality TV show next week or you might outlive all your neighbors dancing the samba until your 95th birthday. For the great majority of us, none of the tests distinguish these two drastically different fates. True to the formula that has dominated medical practice for centuries, your doctor looked for extremes: a high cholesterol value, symptoms of heart disease, reduction in the heart’s blood flow by stress testing.

Your doctor may even recognize this enormous limitation, but continues to follow a testing menu that has changed little over the last 30 years. Somehow, science failed to trickle down to the mainstream physician, who still accepts as routine that some proportion of his/her patients will “inevitably” have heart attacks or die of heart disease every year despite routine screening efforts of the sort that are practiced thousands of times each day nationwide.

It boils down to this: The hapless family doctor, internist, or cardiologist looking for telltale signs, red flags, or black and white answers, usually fails to find any, and instead ends up just hazarding an educated guess based on an antiquated list of risk factors and simple observations. Expecting your doctor to predict whether or not heart attack is in your future from the tests he/she has come to rely on is tantamount to hoping he/she is gifted with supernatural fortune telling abilities.
Heart disease: A numbers game?

Your doctor knows it. The drug industry knows it. Cardiologists know it. Now, you know it, too: Cholesterol testing is a flawed approach to heart disease prevention.

There have been efforts to improve on prediction of heart disease by adding other measures to cholesterol testing. The most popular means of incorporating multiple risk measures is the Framingham risk score, a system that arose from observing the residents of Framingham, Massachusetts, starting back in 1948.

The Framingham risk score is a risk-assessment tool that has become the basis for heart disease prediction now used by practicing physicians. The Framingham system determines that:

- 35% of adults in the U.S., or 70 million, are deemed “low-risk.” Low-risk is defined as the absence of standard risk factors for heart disease; low-risk persons have no more than a 1-in-20 chance (5%) of dying from heart disease in the next 10 years (Greenland P et al 2001). The American Heart Association (AHA) advises physicians that no specific effort at risk reduction is necessary.
- 25%, or approximately 50 million, U.S. adults are deemed “high-risk,” based on the presence of 2 or more risk factors. High-risk persons experience 20-30% likelihood of heart attack in the next 10 years (Wilson PW et al 1998). People at high-risk are candidates for preventive efforts according to the guidelines set by the Adult Treatment Panel-III (Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults; ATP-III) for cholesterol-reducing statin drug treatment and for “lifestyle-modifying” advice.
- The remaining 40% of the adult population, or 80 million people, are judged “intermediate-risk,” with likelihood of heart attack between 5-20% over the next 10 years (Jacobsen TA et al 2000). According to ATP-III, this group should receive preventive advice and might be considered for statin drug treatment.

Let’s do some arithmetic. By the above scheme, the low-risk population will experience up to 3,500,000 heart attacks over the next decade, or 350,000 heart attacks per year.
The intermediate-risk population will, without preventive treatment, experience 8,000,000 heart attacks over a 10-year time period, or 800,000 per year (if we take the middle-ground of 10% likelihood of heart attack).

The high-risk population, the group most likely to receive standard advice on diet, exercise, and be prescribed statin cholesterol drugs, will have risk reduced by 35% by preventive efforts over the 10-year period (Smith SC et al 1995). This means that heart attacks over 10 years will be reduced from 12,500,000 (once again, taking the middle-ground of 25% likelihood of heart attack) to 8,125,000 by standard prevention efforts, or 812,500 heart attacks per year.

This means that, following the standard approach, applying the widely accepted Framingham risk scoring system and engaging in preventive practices as advocated by the AHA and ATP-III, will permit “only” two million heart attacks this year. (It also assumes that physicians will actually comply with standard advice, including going through the motions of performing the Framingham risk calculation. In reality, they often do not.)

These frightening predictions do indeed play out in real life. The numbers of heart attacks, death from heart attacks, and hospitalizations for unstable heart symptoms, as reported by the AHA (AHA 2008 Update; http://circ.ahajournals.org/cgi/content/full/117/4/e25) correspond to the numbers provided by these predictions.

These numbers are no secret. They are well known facts that have simply come to be accepted by the medical community. In other words, the standard approach to heart attack prediction makes no mystery of the fact that two million people will succumb to cardiovascular events in the next year. This exercise in prediction is coldly accurate when applied to a large population.

The fundamental problem is that this approach cannot reliably distinguish which individuals will have a heart attack from those who will not. From 100 people chosen at random, for instance, the numbers game played above will not confidently identify who among those 100 will have a heart attack, who will not, who will develop anginal chest pains and end up with stents or bypass surgery, or who will die. We just know that some of them will. Some people at high risk will have a heart attack, some people at intermediate risk will have a heart attack, some people at low risk will have a heart attack. For any specific individual (like you or me), it’s essentially a crap shoot.

“I passed my stress test . . . So why did I have a heart attack?”

If standard risk calculation is so flawed, why not have everyone undergo another sort of screening test, such as a stress test?
Stress testing encounters similar limitations in predicting who will and who will not have a heart attack, especially if applied to a broad population without symptoms of heart disease. Analyses from the Framingham Heart Study, for instance, have shown that, while abnormal stress tests in people without symptoms suggest an increased long-term risk for heart attack, many future heart attacks occur in those with normal stress tests (over 18 years of observation; Balady GJ et al 2004). The AHA, in fact, classifies stress tests as a “Class IIB indication: Usefulness/efficacy is less well established by evidence/opinion” in people without symptoms of heart disease (Gibbons R et al 2002).

Why don’t stress tests serve to uncover coronary heart disease in people without symptoms? Stress tests are an effective means to detect areas of poor blood flow to the heart. So, for instance, if there is a 90% blockage in one artery, this is reliably detected with a stress test. Stress tests usually detect blockages when they meet or exceed 70%—anything less than this is not detected (Lauer M et al 2005). A person with dozens of lesser blockages of, say, 20%, 30%, 40%, or 50% will therefore not be detected by stress tests. For every one person with blockages severe enough to be detected by a stress test, there are dozens, if not hundreds, of people who fail to be detected by a stress test but harbor one or many lesser blockages.

The Uncertainty Factor

In truth, testing for heart disease today is plagued by a substantial uncertainty factor. The uncertainty factor is responsible for the many stories we’ve all heard: the neighbor who passed a stress test on Tuesday but died of a heart attack on Thursday; a grandmother with lifelong high cholesterol who never suffered a stitch of heart disease; the 44-year old slender, active athlete who died suddenly of a heart attack while jogging. None of these situations are predicted by your doctor’s search for extremes.

The practical reality is that 90% of future heart attacks will not be predicted by any of the conventional tests, a nine out of ten chance that the battery of testing you just submitted to failed to identify impending heart attack. The vast majority of doctors follow the sequence of testing described above, not much different than taking a roll of the dice with the odds heavily stacked against you 10 to 1. All too frequently, false reassurances are provided that hidden heart disease is not present.

Alternatively, what if a suspicious abnormality is uncovered, such as an abnormally reduced area of blood flow on a stress test? Then comes a visit to the cardiologist, followed by a heart catheterization, an angiogram of the heart performed with insertion of hollow-tubed catheters into the body. While 80-90%
of people end up with stent(s) or bypass surgery, the other 10-20% of the time the catheterization reveals no coronary disease This sequence plays out thousands of times each day in the U.S.

The curious discrepancy is that, while heart procedures like implanting stents and performing bypass surgery are unquestionably good for relief of symptoms like chest pain and breathlessness, they have never been shown to be superior to a program of prevention in people without symptoms. Major heart procedures, regardless of how well they are done, no matter how skilled or experienced the cardiologist or thoracic surgeon, have never been demonstrated to reduce the risk of future heart attack or prolong life in people who begin the process without symptoms.

The dispute is not so much over the value of heart procedures per se, but their value in people without symptoms who are thought to be at risk.

There is even doubt over how beneficial major heart procedures are in people with symptoms of heart disease. In the recently published COURAGE Trial, 1100 participants symptomatic with angina (chest pains) who underwent angioplasty and stent placement were compared with 1100 symptomatic participants who received a basic (what the authors called “optimal”) regimen of medication (statin cholesterol drugs, aspirin, blood pressure medication) over a period of five years (Boden WE et al 2007). The group undergoing procedures experienced no advantage in terms of heart attack or death, though a proportion of people taking medication only did “crossover” to require a procedure to relieve progressive symptoms. (You will see, as your learn more about the Track Your Plaque program, how anemic this so-called “optimal” medical therapy truly is.)

**Acute cardiovascular care: the $400 billion burden**

American cardiovascular care consumes $400 billion a year.

How much is $400 billion? It equals the amount of money spent during the first three years of the Iraq war. It matches the 2005 U.S. Department of Defense budget, or the national deficit in that same year. It dwarfs the $210 billion cancer care industry. It represents nearly $10 million dollars spent every hour, 24 hours a day, 7 days a week.

Healthcare expenditures absorb 20% of the U.S. economy, equal to that of the entire U.S. manufacturing sector (Center for Healthcare Statistics). Per capita spending on healthcare is $6,280 per year, double that of other modern nations, including England, Finland, Canada, Belgium, Germany and Australia (Organization for Economic Co-operation and Development, 2006).
Add to these staggering costs the revenues generated by thousands of companies that provide the props for the system—manufacturers of stents, defibrillators, operating room supplies for cardiac bypass surgery, drug makers who furnish intravenous medications for medical procedures (often costing hundreds to thousands of dollars per dose) and so on—and you have another mind-boggling sum that also runs well into the hundreds of billions of dollars.

To help us get our arms around some of these unimaginable sums, let’s just suppose that 20–30% of all heart-related procedures in the U.S. were found to be unnecessary. If the total bill for cardiovascular disease in the country is $400 billion, eliminating just 20–30% could save between $80 and $120 billion each year.

That “marginal” savings exceeds the sum the U.S. spends on the domestic war on terror. It’s more than double the combined annual budgets of the FDA, DEA, National Institutes of Health, and FBI. It would put $460 into the pocket of every man, woman, and child in the U.S. every year.

What is this thing we’ve created? Is $400 billion and all the effort really necessary? With Medicare careening towards fiscal crisis and annual health insurance premiums skyrocketing into the five-figure range for a healthy family, how much longer can we afford it?

Procedures and drugs taking aim at heart disease appear to be getting better and better—yet the cardiovascular healthcare system grows bigger, generating more procedures, more expensive pharmaceutical agents, costly new devices. A day doesn’t go by that most of us aren’t assaulted with several TV ads, radio spots, billboards, and news reports of hospital heart care.

From the nurse at the bedside, to hospital systems performing hundreds or thousands of bypass operations per year, on down to the technological infrastructure that supports these services, the cardiovascular healthcare system is immense. In fact, it is unprecedented in human history. Never before has so much manpower and money backed up a system of “health.”

In the inevitable swing of the pendulum of human endeavor, American’s addiction to acute healthcare technology has swung too far towards an unsustainable preference for high-tech, high-cost procedures over preventing the disease in the first place.

I would offer the Track Your Plaque program as one means to not only more effectively prevent heart disease, but also help slash the huge burden of healthcare costs.
The dangers of a normal stress test

Coronary disease is the number one cause of death in America, and most physicians fail to effectively screen a seemingly well person for hidden heart disease. Neal’s story illustrates this point:

I met Neal, an electrician, in the emergency room. He was in the midst of a large heart attack that was going to obliterate 50% of his heart muscle. His family physician had performed a stress thallium (a nuclear imaging type of stress test) only one month before, while Neal felt perfectly fine. The stress test was normal: no chest pain, no EKG abnormalities, and the thallium images of coronary blood flow were normal. Neal was advised by his doctor that his heart was in great shape and there was no risk for heart attack in the foreseeable future.

Three weeks later, Neal was lying on a hospital gurney, barely able to talk because of crushing pain in his chest. He answered my questions with few words as possible. He was terrified and bewildered. How could this be happening?

We got Neal through this near-death crisis and salvaged most of his heart muscle with an emergency coronary angioplasty and several stents. After he recovered, Neal asked the obvious question: “Why did I have a heart attack? My doctor said my stress test was fine! He said my heart was in perfect shape! Was the stress test wrong?”

The stress test was not wrong. I reviewed the stress test and it was, indeed, completely normal.

The problem was that it was the wrong test. Contrary to popular opinion, including that held by many physicians, stress testing is not an effective means of screening people without symptoms for the presence of coronary heart disease. This is such an important issue that I will repeat it: In the great majority of people, stress testing is not an effective method of uncovering hidden heart disease.

Then why are stress tests performed? Are they worthless?

In truth, stress tests can be useful diagnostic tools, but only when used appropriately. People who go to the hospital with symptoms, particularly chest pain, can benefit by undergoing a stress test to reproduce the symptoms. The physician needs to distinguish an impending heart attack from the pain of stomach ulcer, pleurisy (inflammation of the lining of the lungs from previous pneumonia), esophagitis (inflammation of the esophagus), gallstones, etc. If chest pain is provoked by walking on the treadmill during a stress test, this is
suspicious for heart disease. The treadmill test (or a pharmacological equivalent) is often combined with a method of imaging blood flow to the heart muscle such as thallium, or methods to image heart muscle strength such as echocardiography (ultrasound). If there is poor blood flow to a specific segment of the heart’s muscle, then a blockage in a coronary artery is likely present and your chest pain may represent warnings of a future heart attack.

Using a stress test to detect hidden coronary plaque in someone without symptoms is unlikely to uncover anything, since the majority of people without symptoms have normal blood flow to the heart. The majority of future heart attacks victims are walking around feeling just fine, yet have silent plaque in their coronary arteries. Heart attacks in these people are caused by rupture of a minor plaque, one that may be causing only 20, 30, or 40% blockage, doesn't block blood flow, and is therefore undetectable by any stress test. Plaque rupture, like a little volcano erupting along the length of the artery, is a process that develops within minutes. Stress testing months, weeks, or days beforehand will not anticipate this event. (We will be discussing the concept of plaque rupture at length later in the book.)

What we really want to know is how much plaque is present in a well-appearing person.

To be truly successful at prevention of heart disease, plaque should be detected early. Wait for symptoms to appear and it might be too late; catastrophe may even be just around the corner. In the Track Your Plaque approach, we do not wait for a stress test to show abnormalities, since only later phases of the disease are detectable this way. In Neal’s case, had his coronary plaque been identified before his heart attack, appropriate and powerful preventive action could have been taken. Neal’s near-death episode could have been avoided.

End Sidebar---------------------------------------------

Keeping score on heart disease

If applying an assessment of risk factors is ineffective and allows heart attacks to slip by, and stress tests are a failure, then is there some way to uncover early coronary disease in people who feel well?

There is a way to detect early coronary heart disease that can confer something close to fortune-telling abilities to you and your doctor: a heart scan.

A heart scan is an inexpensive and precise test that uncovers silent coronary disease: coronary atherosclerotic “plaque.” (Atherosclerotic plaque is the abnormal material that accumulates in arteries, the focus for stents and other procedures to re-route blood flow around the plaque, and eventually becomes
responsible for heart attack.) Uncovering hidden heart disease becomes a simple matter. But, like taking blood pressures to the physician of 1910 more comfortable with “pulse palpation,” the wonderfully straightforward approach of scanning for coronary plaque has simply not worked its way into the day-to-day thinking of most practicing physicians.

A heart scan is simply a test performed in one of the newer versions of computed tomography (CT) scan devices able to acquire images of a rapidly-moving heart in constant motion. Imaging the heart, beating at 60 or so times per minute, requires technology that can “freeze” images in a split-second. This engineering feat has only been accomplished in the last few years.

CT heart scans have become available to virtually every American near a hospital with a newer-generation CT scan device, and requires all of 30 seconds with radiation exposure equivalent to that of a mammogram or two (the equivalent of 4 to 10 standard chest x-rays). In most states, heart scans are obtainable just by scheduling an appointment: no doctor’s order, no preparation. Cost nationwide averages $200 (with cost plummeting over the last few years as hospitals and scan centers compete and try to seize “market share” over the people who have heart disease uncovered).

Heart scans provide a “score,” an index of the amount of coronary atherosclerotic plaque present. Just like the score in a basketball game, you can have low scores, intermediate scores, and high scores. A score of zero signifies no plaque; any score greater than zero indicates increasing degrees of atherosclerotic plaque lining the coronary arteries, up to scores in the thousands. Heart scans are painless and precise. Plaque is detectable—and quantifiable—years, even decades, before symptoms are present, years before it is detectable by stress testing. Plaque can be detected in people with low cholesterol, high cholesterol, diabetics and non-diabetics, people with risk factors or without risk factors, in smokers as well as non-smokers, people with red hair or brown hair, tall people or short people . . . you get the idea.

Heart scans don’t actually measure plaque directly, but measure the calcium content of atherosclerotic plaque. Calcium serves as a gauge for plaque. This important insight was discovered by the Mayo Clinic’s Dr. John Rumberger in 1995, when he and his team demonstrated through autopsy specimens that coronary calcium consistently occupies 20% of total plaque volume in men, women, young, old, people with heart disease and those without. Thus, 2 mm$^3$ of calcium corresponds to 10 mm$^3$ of total plaque (We will explore this phenomenon further.) Subsequent studies validated this measure and demonstrated that the quantity of coronary plaque can be accurately measured using sufficiently rapid CT scanners in living, breathing humans using this device.
Plaque is *not* a risk factor for a disease. It is a *measure of the disease itself*: coronary atherosclerosis. That’s why it serves so well as a crystal ball for the future, superior to measures of risk.

**What is Track Your Plaque?**

The Track Your Plaque program answers the questions: If atherosclerotic plaque in coronary arteries can be imaged and measured, can it be tracked over time? Can it be *reduced*?

You and I can *double or triple* the quantity of coronary plaque in our arteries in a year’s time while feeling fine, eating a low-fat or low-carbohydrate diet, or following an extreme fitness program. Precisely measure plaque, and you can gauge with confidence whether disease has progressed or not. As coronary plaque grows, the danger of heart attack and death grow with it. Conversely, as coronary plaque shrinks, so does risk of heart attack and death.

*Track Your Plaque* is *not* just a new diet that, by eliminating or adding certain foods, boasts of a “cure” for heart disease. Let’s face it: eating more broccoli or less red meat will not “cure” heart disease. Nutrition is important, but no matter how good your diet, it does not cure the genetic causes of heart disease. It is only a part of the final answer.

While the *Track Your Plaque* program begins by quantifying atherosclerotic plaque with a heart scan, the subsequent steps are what really make the program a success. Once plaque is identified, what can be done to put a stop to it? Surprisingly, many of the answers have been available for years, answers based on hard scientific developments but were never applied in this direction.

Using the framework of what works, what doesn’t in gaining control over heart scan scores, the *Track Your Plaque* program assembles a unique set of strategies that provides maximum advantage. It is a program that employs nutritional strategies and nutritional supplements targeted to specific causes of coronary plaque, with a minimum of medication. While success or failure is ultimately based on the results of a second heart scan, usually obtained one year after the start of the program, feeling better, having more energy, working and thinking more effectively, all develop almost immediately, within the first few days to weeks. Conventional cholesterol values will improve to levels far beyond that usually achieved—with little or no medication. Many of you will be interested to know that weight loss of 25, 30, or 40 lbs are typical in the first several months of the *Track Your Plaque* program. These sorts of results that far exceed the meager gains made through standard approaches is the reason why the *Track Your Plaque* approach can accomplish what other programs have tried to do but failed.
Track Your Plaque is an information resource on how to apply this new approach. You won’t have to wait for life-threatening symptoms, nor rely on cholesterol numbers. You won’t have to depend on some intuitive feeling that you might have a heart attack. Tracking your plaque tells you whether you have coronary plaque, how much, what the future holds. It provides feedback on the results of your efforts. It is a real world method of managing heart disease risk that anybody can follow.

The Track Your Plaque 3-step program

Track Your Plaque can show you, in three basic steps, how to identify and then seize control of heart disease in your life. In Step 1 of this proven approach, you’ll be shown how to detect hidden coronary heart disease years before danger strikes. The most widely available method to detect silent heart disease is coronary calcium “scoring” obtained through the increasingly available computed tomography (CT) heart scanners. Direct measurement of hidden coronary plaque eliminates the murkiness of “risk factors” like cholesterol testing, and the unacceptable imprecision of stress testing. These new technologies make the identification and precise measurement of coronary plaque a safe, inexpensive, 10-minute process that just about anybody can obtain.

In Step 2, you’ll be shown how to uncover the causes of heart disease. Among the techniques used is the powerful technology of lipoprotein analysis. This exciting technology easily pinpoints the causes of heart disease even when cholesterol testing fails. Time and again, people who’ve survived heart attacks are told that no cause for their heart disease could be found. Yet when lipoproteins are tested, the causes seem almost obvious. Step 2 will also introduce the important concepts of vitamin D and thyroid normalization, two of the newer additions to the Track Your Plaque program. Having greater insight into the causes for heart disease—well before heart attack—arms you with better tools to control coronary plaque.

Once your coronary plaque is scored (Step 1), and its causes pinpointed (Step 2), you can then begin Step 3, applying effective therapies that can, with proper guidance, slow, stop, or reverse coronary plaque and thereby reduce or eliminate the prospect of heart attack or major cardiac procedures in your lifetime. This includes a discussion of the two absolutely crucial nutritional supplements for your plaque-control program, vitamin D and omega-3 fatty acids from fish oil.

Track Your Plaque is therefore a three-step program that shows you how to:

1) Detect and measure coronary plaque
2) Identify the causes of your coronary plaque
3) Effectively *treat the causes* in order to arrest or reduce the amount of plaque you have.

If we can now measure coronary plaque, identify its causes, then correct them, the *Track Your Plaque* approach has the distinct potential to crush the current *crisis management* approach of “modern” cardiovascular care.

**Is *Track Your Plaque* right for you?**

*Track Your Plaque* is primarily designed for people *before* heart attack and major heart procedures. Part of the reason for this is that the preventive efforts we will discuss can take months to years to take effect. A person who develops progressive or unstable symptoms of heart disease (rapidly progressing to a full heart attack) lacks sufficient time to take full advantage of these principles. As powerful as *Track Your Plaque* treatments are, they do not halt the progression to heart attack once this process is near completion. If you are having symptoms of chest or arm pain, or breathlessness, you may not be ready for this program. You may need the testing facilities provided by your doctor or hospital first, before you can safely consider these strategies.

Or, perhaps you’re the kind of person who requires the reassurance of a hospital, people in scrubs and masks, and glitzy marketing. *Track Your Plaque* might not provide you with the kind of support you require. I may be critical of hospital marketing, but I do not underestimate its power to influence people. Some people just need this sort of “legitimizing” presentation of their healthcare, and independent, self-empowering practices may not suit you. If you think that this may apply to you, I’d still encourage you to read on to acquire a healthy dose of skepticism.

On the other hand, the earlier you start your program, the more power you will have over your future. Preventing heart disease is a lot like saving for retirement. If you start at age 35, saving a little at a time will yield a comfortable nest egg. Start at age 60, and you’ve got to scramble to reach the same goal, or it might not be possible at all. The same holds true for inhibiting progression of coronary plaque.

If you’re a smoker, this book is not for you, at least not until you quit. No program will fully overpower the negative effects of smoking. I’ve seen people who did everything else right yet continue to smoke, and the quantity of coronary plaque doubles in a year’s time. Smoking, even just a few cigarettes a day, so overwhelms all your positive efforts that growth of your coronary plaque is inevitable. You’ve simply got to stop smoking to gain control of your plaque.

If you’re looking for a quick answer—a quick diet, nutritional supplement, prescription medicine—that “cures” you of heart disease and then you’re done,
you will not find your answer in this book. People with this attitude often don’t take their risk for heart disease seriously. They don’t participate in the learning process, are unwilling to make lifestyle changes that may be necessary, and will be disappointed.

On the other hand, people who succeed in Track Your Plaque tend to be motivated by learning and searching for self-empowering methods to preserve health. They recognize that health does not come from a single pill or diet, but grows from a combination of healthy habits. They understand that heart disease is a complex process with causes that vary from individual to individual, and that treatment and prevention also need to be individualized. This program appeals to people who are not content following the footsteps of their parents or other family members with heart disease, won’t accept the inevitability of heart disease, and are willing to invest time and energy to create their own heart disease-free future.

Tracking plaque, while effective and not all that difficult, cannot be distilled down to a single diet or pill. It is a comprehensive program that will require some effort, including a search for local resources in your area to assemble your own program. But the rewards can be great: prevention of a dangerous heart attack and avoidance of major heart procedures, potentially for a lifetime. Once you see the details and experience the results, I believe that you will agree that this is a far more rational way to approach the terribly common specter of heart disease.

Track Your Plaque is a program for life. After you’ve begun your own Track Your Plaque program, going back to old habits and hoping that the initial benefits will hold, will result in failure. Old habits will revive quiescent plaque and reactivate the lipid/lipoprotein and genetic patterns that created plaque in the first place. You’ll be right back where you started. Track Your Plaque is therefore not a one time “quick-fix,” but a lifelong program for health.

We have experienced a confluence of technological development that now makes early heart disease detection and prevention a practical reality. Despite the alarming epidemic of heart disease and its catastrophic consequences, the concept of early heart disease detection has not yet reached mainstream medical practice. The history of medicine is full of instances in which new technologies and new ways of viewing a disease fail to gain traction in the mainstream medical community for years or decades. Track Your Plaque has made the leap, assembling new technologies into a powerful program of heart disease prevention.