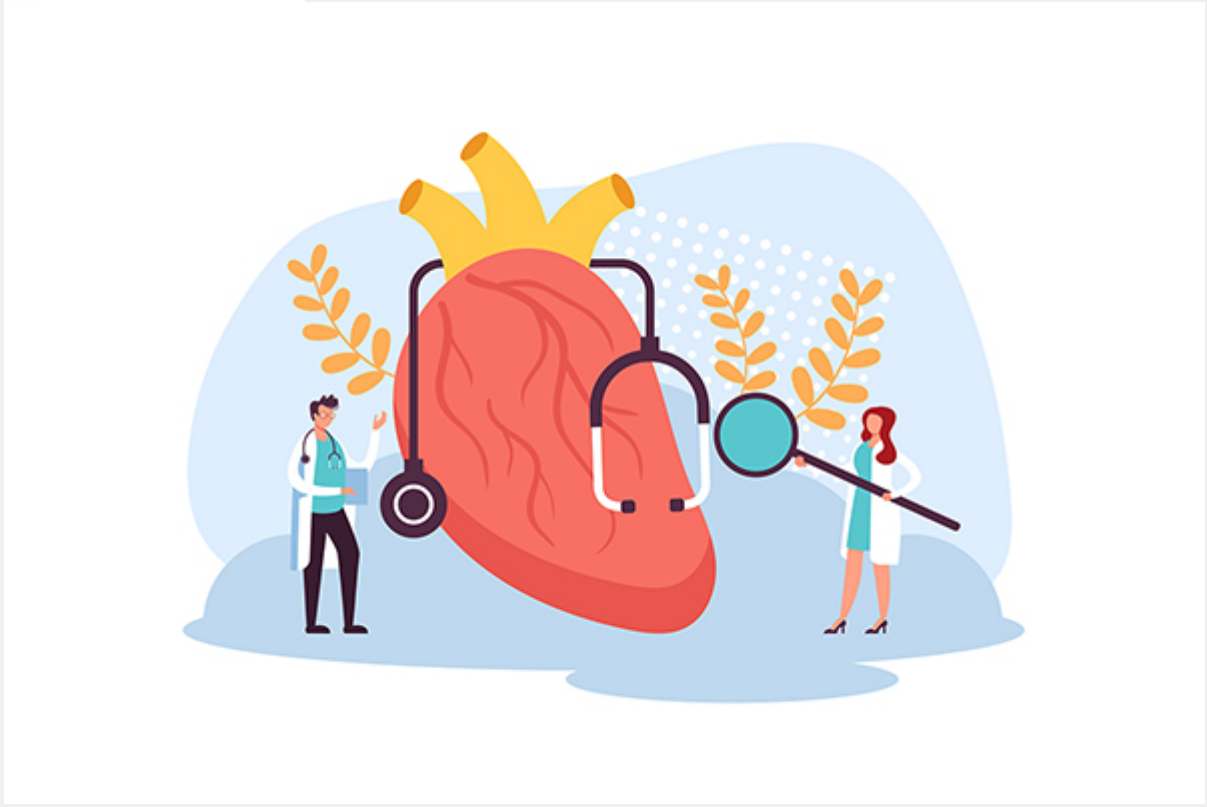
What’s the best test to determine your risk of heart disease?



These days, I’m seeing a lot of patients who are concerned about their hearts. I’m kind of like a Court of Appeals for individuals who have just received a life sentence in statin jail from their doctors. They want a second opinion with an opportunity for a reprieve: “Doc, do you really think I need those drugs?”

I don’t side with those zealots of natural medicine who believe cholesterol-lowering drugs are an unadulterated evil. There’s incontrovertible evidence, in my opinion, that these drugs can reduce the risk of heart attacks and strokes in high-risk persons. But for those at low risk, they’re a waste of time, and moreover, pose risks of unnecessary side effects.

And, while too many stents are unnecessarily placed to open up blocked coronary arteries—without good evidence they benefit survival—there’s a time and a place for them. Even bypass surgery can give properly-selected patients a new lease on life.

So how do you differentiate?

The traditional way was to look at blood tests. Everyone with a cholesterol above a certain threshold—and that number has been progressively lowered—is said to deserve a statin. Refinements on risk assessment can be obtained when we slice and dice to

reveal LDL cholesterol, LDL particle size, Apo B, HDL, lipoprotein a, high sensitivity C-reactive protein, homocysteine, etc.

Then we can factor in family history of heart disease, smoking status, overweight, blood sugar, age, and sex. There are calculators where you can plug in some of these data to obtain your ten-year risk of heart disease. The trouble with these is that they stack the deck toward the conclusion that pretty much everyone should be on drugs.

The problem is that nearly half of heart attacks occur in people without recognized risk factors; conversely, some people with sky-high cholesterol and a preponderance of risk factors never succumb to cardiovascular disease.

The other way to assess risk is via a stress test. But these capture heart disease when it's so advanced that there's significant blockage. Additionally, there's a high incidence of false-positive stress tests, especially in women.

A positive stress test puts you on the invasive cardiology conveyor belt to the cath lab. A tube is threaded into the femoral artery in your groin or radial artery in your wrist and shimmied into your heart chambers where dye is injected to illuminate your coronary arteries. Flow can be measured across areas of partial blockage. This is said to be the "Gold Standard" for assessing cardiovascular risk.

But there can be side effects, including bleeding and heart damage, albeit only in around 1% of cases. Moreover, once you're on the table, there's a significant chance you'll wake from anesthesia with a couple of stents due to confirmation bias and the inevitable impetus to fix. Studies have shown that while caths may reveal obstruction, patients with stable heart disease enjoy no overall survival benefits with stents as compared to those undergoing standard medical management. Hundreds of thousands of these procedures may be performed unnecessarily each year in the U.S., relegating patients to a lifetime on blood thinners and with pronounced tendency toward re-occlusion of the stented vessels.

There has to be a better way. For decades, I've been an advocate of the coronary artery CT scan, or CAC, which yields a composite score of the calcium that has accumulated in the walls of main heart arteries. A zero score, or one in the low single digits, is generally a sign that, despite high cholesterol or other risk factors, you're in the clear when it comes to heart disease. Drug treatment would be a waste of time.

On the other hand, a score in the 100s warrants further attention, possibly with more precise imaging to see how consequential it might be.
Disconcertingly, according to Dr. Matthew Budoff, "A patient with a CAC score greater than 300 has the same CV risk as a post-MI survivor."

A MESA calculator enables you to factor in your CAC score to predict your risk of heart disease.

But there are limitations to the test:

- It doesn't tell you whether you have blockage; it only indicates whether atherosclerosis is underway. The CAC scan localizes the calcium to some extent, assigning a score to each of four critical heart arteries, but doesn't predict whether arteries are narrowed.
- CAC only reveals the presence of hard calcified plaque; it's argued that soft, friable, sticky plaque is the culprit in heart attacks. Moreover, in individuals younger than 40 who have premature coronary disease, soft plaque

predominates, because it may precede the formation of calcified plaque. Nevertheless, a zero calcium score is pretty golden, particularly if you're 65 or older.

- CAC can't be repeated to gauge the efficacy of dietary, exercise, supplement, and medication interventions because plaque scores increase regardless of countervailing measures. In fact, upticks in calcified plaque may be a *good* sign that dangerous soft plaque is being replaced by reparative "spackle" that seals off the dangerous lipid cap that's an incitement to blood clots. This may underlie the oddity that statins appear to accelerate increases in calcium scores, while ultimately conferring at least nominal protection against heart attacks.
- Paradoxically, very high-end lifetime endurance athletes have *higher* calcium scores than their less active (but healthy) peers. But the benefits of all that exercise generally outweigh the downsides of the excess plaque.

Hence the need for tests like the coronary CT angiogram (CCTA). Unlike the regular CT calcium score, CT angiograms require an injection of dye in an arm vein to highlight the coronary arteries. Software programs then go to work to analyze, not just the presence of calcium, but also the precise composition of plaque, whether it's hard or soft, and whether there's a critical narrowing. The test can be repeated if, say, a patient undergoes a program of diet, exercise, and supplementation, with or without cholesterol drugs, to see if there's an interval improvement, not merely in the quantity of plaque, but in its *quality.*

I recently interviewed Dr. James Min of CLEERLY Health on the advantages of CCTA.

But again, as with CAC, there are limitations to CCTA. Say, for example, the CCTA spots a narrowing. You might still have to undergo a catheterization with all its attendant risk and expense to make a determination if the blockage is significantly compromising flow.

Enter the coronary CTA with FFRCT, which uses an improved software application to create a digital 3D model of the arteries leading to the heart. Computer models then simulate blood flow within those arteries to assess whether the flow has been restricted by any narrowings or plaque buildup.

In the recent PRECISE trial, it was found that CTA with FFRCT reduced the need for catheterizations; when catheterizations were performed based on a CTA with FFRCT finding that there was critical blockage, patients were only one-third as likely to have what turned out in retrospect to be an unnecessary catheterization showing no obstructive disease. In other words, the patients who got caths probably really needed them, and appropriately got stents.

Unfortunately, the problem with these imaging tests is that, as with many great medical advances, it takes a long time before they're accepted. Few centers are equipped with the sophisticated gadgetry, costs are high, and insurance coverage is sketchy.

There are doctors who still prefer to "fly blind" and put virtually all their patients on statins, or ship patients to cath labs, "just in case". The result is that we're simultaneously both under- and over-treating a significant proportion of the population. Which is so *not* Precision Medicine.

And that's a profound disservice to the 697,000 people who die of heart disease in the United States every year—that's one in every five deaths, the leading cause of

mortality in America.