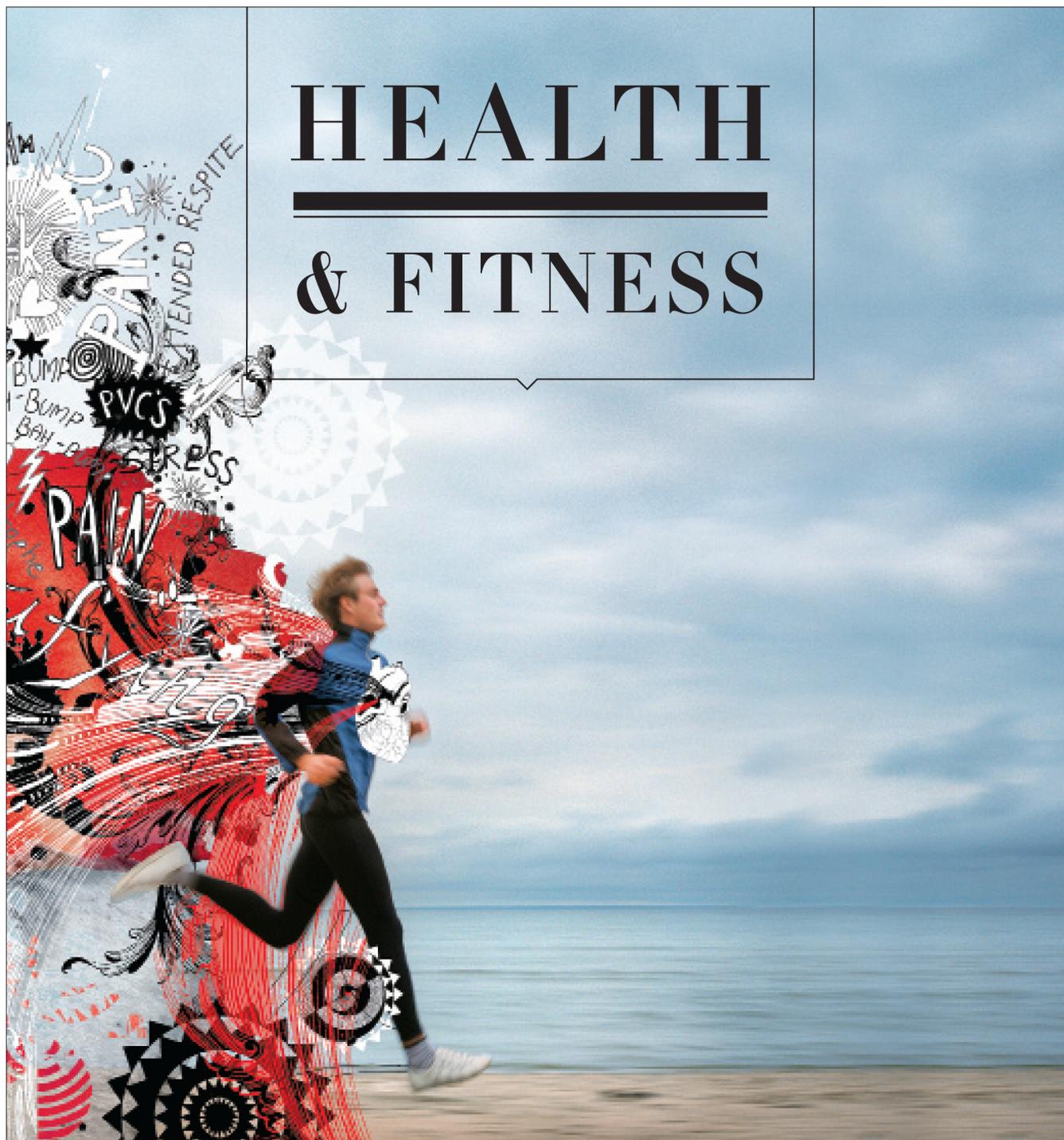


HEALTH & FITNESS



SUDDEN DEATH

When active and healthy **MICHAEL BEHAR** is awakened one night with palpitations, he learns of a potentially fatal condition that causes athletes' hearts to fail without warning.

I'M STILL LOOPY FROM THE ANESTHESIA WHEN A BLURRY silhouette stoops over my hospital bed and announces, "You're gonna live." It's my cardiologist, Nelson Trujillo. Thirty minutes earlier, while I snoozed blithely, Trujillo shoved a hollow plastic catheter through the skin above my right groin and into my femoral artery. He snaked the flexible tube north about two feet, through my aorta, until he entered my right

coronary artery. Into the catheter he squirted a "radiocontrast agent" that tinted my blood with a reflective dye. As a technician steadied a hefty rectangular imaging device called a fluoroscope over my torso, Trujillo watched an adjacent monitor that displayed the dyed blood circulating through my beating heart.

The procedure, an angiogram, is typically a last step for cardiologists trying to figure out if your heart is in serious trouble. For the

most part it's administered to old guys with beer guts who complain of chest pains, or used on post-heart attack victims to survey the carnage. "The angio lets us see what happened and what's left," Trujillo said. I'm neither old nor obese, and I can definitively confirm that at 39, my heart, thus far, has not attacked me. Still, my doctor had urged me to "get poked," as he put it, because of what brought me to his office in the first place.

It began six months ago. I awoke at dawn with a quaking flutter in my chest, as if I had swallowed a toad suffering from Saint Vitus's dance. I felt my pulse. Bah-bump, bah-bump, bah-bump... then nothing. Bah-bump, bah-bump, silence. Every second or third beat was conspicuously absent. It was painless but terrifying. I called Rocky Mountain Cardiology, Trujillo's practice in Boulder, Colorado, where I live. His assistant urged me not to panic (too late) and instructed me to get my ass across town to their clinic pronto or call 911. Since I wasn't dead yet and hate hospitals, I chose option one. When I got there a lab tech slapped an EKG on my chest. Randomly interspersed amid my normal heart rhythm were fleeting microbeats followed by prolonged pauses. "Those are PVCs," Trujillo told me. "Premature ventricular contractions. Everyone has them, only most of us never feel them. But you're having a lot of them. Now we have to figure out why."

PVCs happen when an errant twitch in cardiac muscle induces a contraction. The heart responds by taking an extended respite before continuing with its normal rhythm. PVCs are typically benign, and under stress almost everyone has a few. But Trujillo was troubled because mine occurred always and often, even while I slept.

"If you were my brother I would suggest an angiogram," he said. "It's the only way we can see for sure what's going on in there." I had to wait two weeks, and it came right before I would mark the first anniversary of the death of a close friend. His heart stopped as he was nearing mile 24 of a marathon. We were almost the same age, though he was in far better physical shape. I was scared shitless.

According to Trujillo my symptoms could mean one of several ills. I could have a blocked artery. "It's not unheard of for people your age," he told me. Thankfully, it's rare, with deaths from that ailment totaling just 26 for every 100,000 men between ages 35 and 44. Another possibility was that a virus had ransacked my heart. Research over the last decade

has shown that several run-of-the-mill respiratory viruses can infect heart tissue and do permanent, even fatal, damage. Yes, a cold can kill you. My doc also wondered if I had taken a hard fall recently, landing on my chest. "A blunt force to your heart could create scar tissue and trigger the PVCs," he explained.

But the most alarming disease I'd heard mentioned was hypertrophic cardiomyopathy (HCM), a condition that kills with little

left ventricle. "Soon the muscle fills the cavity in the heart where the blood goes," Trujillo says. "The process is not well understood, but the muscle gets so thick it obstructs the blood leaving the heart," Trujillo says. Not only that, but the muscle becomes what cardiologists describe as "disorganized," a condition that short-circuits the electrical signals that normally fire predictably and smoothly through the heart. "Because the muscle is disorganized, the electrical signals are also disorganized — and the heart stops and you drop dead. You may not have a single warning sign before a heart attack."

A March 2007 study published in *Circulation*, an AHA journal, reported that in athletes younger than 35 years old, HCM causes 36 percent of sudden deaths; coronary artery anomalies account for 17 percent; and about a dozen rarer heart flaws share the blame for the remaining fatalities. Compounding the problem is that undiagnosed coronary artery disease, a.k.a. clogged arteries, can be an equally stealthy killer of those between 35 and 40. Why? Because middle-aged athletes often ignore the known red flags. "Young, healthy people can be quite good at rationalizing how they feel," says Dr. Steve Ommen, a cardiologist at the Mayo Clinic in Rochester, Minnesota. "They can have shortness of breath, get light-headed, and have fainting episodes" and unwittingly chalk it up to a crummy workout.

HCM is undoubtedly the big one. A virtually silent killer lurking in the hearts of up to 1.5 million Americans, it's what took my marathon-



HCM LURKS IN THE HEARTS OF UP TO 1.5 MILLION AMERICANS. IN ATHLETES UNDER 35, IT CAUSES 36 PERCENT OF SUDDEN DEATHS.

or no warning. Dr. Daniel Rader, director of preventive cardiovascular medicine at the University of Pennsylvania School of Medicine, a relatively new field of study aimed at diagnosing potentially fatal heart conditions before it's too late, told me that "the vast majority of young people and athletes who die from heart failure won't have any symptoms."

PHYSICIANS CALL IT SUDDEN CARDIAC death, and the cause is often linked to faulty genes. When you were just a fetus, bits of rogue DNA were conspiring to trash your ticker. The statistics are grim. According to the American Heart Association (AHA), one in every 500 people has HCM, which causes a thickening of heart muscle.

Doctors aren't sure why, but HCM increases the amount of muscle in the heart's

ing friend. And it took the lives of college basketball star Hank Gathers, San Francisco 49ers offensive lineman Thomas Herrion, and Celtics forward Reggie Lewis — each with little or no warning.

Compounding the problem is that people with HCM might actually be destined to become athletes. Big, enlarged hearts can give you an edge in competition. "People with HCM, with that thick muscle, are predisposed to be athletic guys," says Trujillo. This makes diagnosis increasingly tricky. "There is a very thin line, a crossover where the thickening can become pathologic as opposed to being healthy." This could be why doctors cleared Ryan Shay to run competitively at the age of 14, even though he was diagnosed with an enlarged heart. He died at 28 while running the U.S. men's

marathon Olympic trials in New York last year. HCM is the suspected killer, although autopsy results were inconclusive.

As if HCM weren't enough to worry about, athletes are also dying from coronary artery anomalies (arteries sprout where they're not supposed to), mitral valve prolapse (your plumbing leaks), and arrhythmogenic right-ventricular dysplasia (fat or scar tissue invades healthy muscle). For the most part prior symptoms betray none of these lethal conditions. This frightening reality is spawning a paradigm shift among a cadre of progressive cardiologists who are ditching the wait-and-see approach. "A lot of physicians are still mired in the looking-for-symptoms mode," notes University of Pennsylvania's Rader. For decades cardiology has been reactive. A patient complains of chest pain; tests are administered; treatment ensues. Ask your physician for a heart exam sans symptoms, and he or she will more than likely dismiss you as a sniveling hypochondriac. "If you're in perfect shape and you say you just want to start running marathons, it's going to be a hard sell to get them to do anything," says Rader. The rationale for advance screening, he argues, stems from new science showing that some of the deadliest heart conditions are killing an increasing number of seemingly perfectly healthy individuals. Had the victims known of their conditions, their lives might have been easily saved.

IN A FRENZY OF PANICKED GOOGLING A couple of days before my scheduled angiogram, I searched for answers, wondering if my heart was at risk of going kablooeey. Trujillo agreed that my age, my sacrosanct diet, my fanatical gym regimen, and my cardio-fortifying weekend endeavors were



LIFESAVERS

Think you might have a heart defect, or simply want peace of mind? These five tests will help your doctor keep you right on ticking.

EKG

An electrocardiogram (derived from German *elektrokardiogramm*) records electrical activity in your heart and spits out a seismograph-style printout. Physician's tip: "Make sure it's a 12-lead EKG," says Trujillo. In plain speak, he means that EKG leads are used to record heart data from 12 different points on the body.

WHEN YOU NEED IT: This is the equivalent of getting your blood pressure checked. It's a baseline analysis, typically conducted before proceeding with further tests. Be skeptical if an EKG isn't the first thing your cardiologist recommends.

WHERE YOU CAN GET IT: Most every doc can do one, but your cardiologist is better trained to spot potential warning signs.

WHAT'S INVOLVED: Painless, unless you're hairy; then expect to get shaved so the self-adhesive EKG leads will stick to your skin.

Echocardiogram

Blasts you with high-frequency acoustic waves to "see" your heart. Make sure your doc is using the latest system, which will incorporate real-time 3-D imaging technology and pulsed Doppler, both essential for spotting leaky valves.

WHEN YOU NEED IT: If red flags show up on an EKG, or if HCM is suspected, an echo can refine the diagnosis. Cardiologists usually order both an EKG and echo to be done in a single visit.

WHERE YOU CAN GET IT: At your cardiology clinic or most hospitals.

WHAT'S INVOLVED: Some slimy, viscous goop akin to K-Y Jelly is slathered on your chest while the tech slides a probe (transducer) over your heart.

MRI

Magnetic resonance imaging uses electromagnetic energy to generate cross-section images of your heart.

WHEN YOU NEED IT: Used post-heart attack to assess muscle tissue damage. Better for diagnosing structural-type disorders, such as HCM or dilated cardiomyopathy.

WHERE YOU CAN GET IT: It's a hospital out-

patient procedure, though larger cardiology clinics might spend the big bucks (\$1 million-plus) for an in-house machine.

WHAT'S INVOLVED: If you're even mildly claustrophobic, get your doc to prescribe a few Valium to pop beforehand. You have to lie prone and perfectly still for up to two hours in a space no bigger than a coffin. And bring earplugs; the machine sounds like a jackhammer.

Coronary Calcium Scan

Fancy imaging software crunches data from a CT scan to render interior views of your coronary arteries. Results are given as a "calcium score." Says Rader, "Depending on age, anything above 400 denotes some fairly substantial coronary plaque and would have implications for considering how extreme you'd want to push yourself in terms of exercise."

WHEN YOU NEED IT: Now. Knowing the condition of your arteries — partially blocked, clear as a newborn's, hopelessly clogged — is essential, even without symptoms.

WHERE YOU CAN GET IT: It's a hospital outpatient procedure.

WHAT'S INVOLVED: Simple and painless. Lie flat on a gurney while a radiology tech slides you into a CT scanner (think giant donut), and hold your breath in spurts.

Stress Test

Even if you've never had a single symptom, experts agree that a stress test is a must. You'll sprint on a treadmill to hit your maximum heart rate while a lab tech records the data from a 12-lead EKG. Paired with an echocardiogram (a stress echo), it'll catch a number of heart ailments.

WHEN YOU NEED IT: Do it as part of an annual physical, or if you're experiencing symptoms such as shortness of breath, light-headedness, or abnormal fatigue during exercise.

WHERE YOU CAN GET IT: A few family docs (general internists) are equipped to do the test, as are all cardiology clinics.

WHAT'S INVOLVED: Get wired up for an EKG, then sprint on a treadmill for about eight minutes or until exhaustion sets in, whichever comes first. —M.B.

INVASIVE BUT DECISIVE

When conventional tests draw a blank and your symptoms persist, doctors may prescribe this more involved procedure to pinpoint the problem.

Catheterization Angiogram

This requires a trip to the hospital, where you'll be sedated while your cardiologist threads a catheter through your femoral artery into your heart. Using a contrast dye and a camera called a fluoroscope, he'll snap pictures of your blood, looking for logjams as it gushes through veins and arteries.

WHEN YOU NEED IT: Chest pain, shortness of breath, and sudden fatigue all might indicate

a blocked artery or other heart trouble. The angio is the only surefire way to know for sure what's going on.

WHERE YOU CAN GET IT: It's a hospital outpatient procedure.

WHAT'S INVOLVED: A potent cocktail of drugs administered through an IV ensures you'll remember very little of the 45-minute procedure. Arrange for a ride home — you'll be too groggy to drive — and expect a purple bruise and some soreness at the catheter entry point near the groin. —M.B.

WHAT'S IN A NAME?



IN THIS CASE,
MOST OF THE
INGREDIENTS.

Introducing Nature Valley® Roasted Nut Crunch Bars. Super crunchy with a hint of sweetness. Available in Peanut Crunch and Almond Crunch.

THE ENERGY BAR.
NATURE INTENDED.™

whatmayours.com

©2011 General Mills

HEALTH & FITNESS

keeping my cholesterol and blood pressure in check, and that translated to pretty good odds that my arteries weren't gummed up with bacon grease. But until he thread a camera into my heart, he couldn't say for sure if some other unknown flaw was poised to take me down for good.

It used to be that family history was a benchmark predictor of heart health. If Uncle Leo had a heart attack at 50, your odds weren't so good, and your doc might advise a cardio checkup at 40. This works reliably for detecting coronary artery disease but not so well for diagnosing latent genetic disorders. Your entire elder clan might be HCM-afflicted octogenarians, but their mutant hearts could thump unhindered for a lifetime. It's very likely you've inherited their DNA. You might not know it, however, until you push your heart to the brink of its physiological limitations and trigger a failure. Competing in an endurance sport, such as a marathon or century ride, would do the trick because it forces your heart to do things it wasn't designed to do. Then again, cardi-

Bulls and hollering into a slot canyon is actually a combo of two procedures: a stress test and an echocardiogram, which snaps ultrasound images of your heart immediately before and after a bout with the treadmill. "This is a simple way to pick up any of the major heart issues," says Rader. "Some physicians might say it's a bit of overkill, and insurance may not cover it, but the cost is pretty minimal compared to the potential catastrophe that can occur."

I'M BACK AT TRUJILLO'S CLINIC A WEEK after my angiogram. We're sitting on metal stools in a dimly lit lab next to his office, staring at an LCD monitor. He double-clicks an icon on the screen, and a grainy black-and-white video begins to play. "Now watch closely or you'll miss it," says Trujillo. It's my heart in real time. As it pulsates, I can see a catheter slither into my left ventricle and eject an iodine-based fluid from its tip. The dye traces a route through wispy arteries that envelop the cardiac muscle. He points to an area on the bottom of my heart where the dye scatters into a fuzzy cloud.

"That spot — about the size of a nickel — is what is most likely causing your PVCs,"

SOME EXPERTS NOW SUGGEST A PREEMPTIVE STRIKE. BEFORE YOU DELVE INTO A NEW SPORT, HEAD FOR THE NEAREST CARDIOLOGY CLINIC AND DEMAND A SCREENING.

ologists warn that you don't necessarily have to run the Badwater Ultra for your heart to prematurely implode. For a few unlucky blokes, "it could happen during basketball with the guys on Tuesday night," says Ommen, who directs the Mayo's HCM clinic. "It's the fourth quarter, and you get that mentality that you want to win, so you throw caution to the wind."

That's why some experts are now suggesting a preemptive strike. Before you delve into a new sport, head straight for the nearest cardiology clinic and demand a screening to find out if misanthrope genes are planning a cardiac coup. "There are no firm AHA guidelines saying that someone who starts a rigorous exercise program should be tested," Rader says, "but I believe in going beyond guidelines."

An EKG is a good start, Rader says, and a stress test as part of an annual physical isn't a bad idea either. (You wear an EKG and sprint to exhaustion on a treadmill while a lab tech inspects the readout for abnormalities.) Then there are blood tests that look for C-reactive proteins, fibrinogen, homocysteine, and natriuretic peptides, which at abnormal levels can be telltales of trouble. But if you could pick a catchall, Rader recommends considering a stress echo. What sounds as if it could entail downing six Red

Trujillo says. "The good news is you've got a clean bill of health." What he means is that my arteries are clear, and genetically my ticker is textbook normal: no HCM. "But this odd little area, where the PVCs are coming from, is a weird piece of muscle, or scar tissue, or maybe something else."

I confess to him that about a year before my PVCs began, I'd had a kiteboarding accident. My waist harness got yanked hard and wedged beneath my rib cage. I thought I'd broken a rib until Trujillo pointed to a spot on my chest — the exact spot where I'd been injured from the harness — and said, "That's where your PVCs are coming from." His best guess was that the fall whacked my heart, resulting in PVC-producing scar tissue.

Ommen, at the Mayo Clinic, agreed to review my test results, and concurred. I have nothing to worry about. The PVCs, though annoying as crap, were benign. At the same time, I'd run up against the current technological limitations of cardiology. There was no way to be certain that the ambiguous spot on my left ventricle was a harmless result of a kiteboarding accident. Might my PVCs get worse over time and my heart grow perpetually weaker, I wondered? "You're not the best example for your article," Trujillo told me later. "Until your heart is in the bucket, that little spot will remain a mystery."