

The Good Heart

Diet and exercise are not the whole secret to cardiovascular health. Mounting evidence suggests that your psychological outlook is just as important.

By Anne Underwood
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Oct. 3, 2005 issue - You can call it the Northridge Effect, after the powerful earthquake that struck near Los Angeles at 4:30 on a January morning in 1994. Within an hour, and for the rest of the day, medics responding to people crushed or trapped inside buildings faced a second wave of deaths from heart attacks among people who had survived the tremor unscathed.



In the months that followed, researchers at two universities examined coroners' records from Los Angeles County and found an astonishing jump in cardiovascular deaths, from 15.6 on an average day to 51 on the day of the quake itself. Most of these people turned out to have a history of coronary disease, or risk factors such as high blood pressure. But those who died were not involved in rescue efforts or trying to dig themselves out of the rubble. Why did they die? In the understated language of *The New England Journal of Medicine*, "emotional stress may precipitate cardiac events in people who are predisposed to such events." To put it simply, they were scared to death.

Folk medicine has always recognized that a sudden fright or bad news can be fatal. And the same Greek word, meaning "constriction," is the root of both "anger" and "angina." But the Northridge study—and others involving survivors of the 1981 Athens earthquake and the 1991 Iraqi Scud-missile attacks on Israel—helped fuel new research in what might be called psychocardiology, the profound connections between emotions and the cardiovascular system. For a long time, cardiologists resisted the idea that the heart, the sturdy wellspring of life, can be fatally deranged by a mental event. But it's not just sudden shocks like earthquakes that kill. Mounting evidence suggests that chronic emotional states such as stress, anxiety, hostility and depression take a far greater toll. "Fifty percent of people who have heart attacks do not have high cholesterol," points out Edward Suarez, associate professor of psychiatry and human behavior at Duke. The risk of psychological and social factors are almost as great as obesity, smoking and hypertension, the traditional medical markers for cardiovascular disease—which afflicts 70 million Americans and is the nation's No. 1 killer. Researchers are now starting to learn why. And a growing number of clinics are putting that insight to work in programs that tackle heart disease at one of its most unlikely sources: in the mind.

Our understanding has proceeded from the anecdotal to the epidemiological to the search for underlying mechanisms. As a critical-care nurse at Mad River Community Hospital in northern California in the 1980s, Debra Moser saw repeatedly how patients' attitudes seemed to affect the course of their heart disease. She was struck by one case involving a man in his 50s with an

uncomplicated heart attack. He should have been out of the hospital within two or three days, but he lingered for six. "It was the first time I appreciated the power of negative thinking," says Moser. "He was very depressed, which is not unusual after a heart attack. But he obsessed over everything. He was hypervigilant about his case. It seemed to us that he worried himself into episodes of recurrent ischemia and chest pain." The chest pain wasn't just in his mind; tests showed reduced blood flow to the heart. Within a year, he suffered another heart attack and died.



Todd Selby for Newsweek

On the Right Track: Pillai's diastolic blood pressure has recently fallen by 15 points

Years later, Moser, now a professor of nursing at the University of Kentucky in Lexington, sought to quantify the effects she observed in that patient. At a meeting of the American Heart Association last fall she presented the results of a trial involving 536 heart-attack patients. She had measured their anxiety levels with a standard multiple-choice psychological test, and kept track of whether they had further complications—such as a second heart attack—while in the hospital. Those who scored the highest for anxiety on the psychological tests were four times more likely to suffer complications than those with the lowest scores. The lesson was clear: "Every day we take patients' blood pressure and listen to their heart," she says, "but we rarely do a systematic assessment of their psychological state, even though anxiety and depression are major risk factors."

In fact, doctors are finding that psychosocial factors pose far greater risks than they previously realized. Take depression. It at least doubles an otherwise healthy person's heart-attack risk, says Dr. Michael Frenneaux, professor of cardiovascular medicine at the University of Birmingham in England. And for people who have suffered a heart attack in the past, depression quadruples or even quintuples the risk of a second one. Hostility is an increasingly important risk factor, too. High hostility levels, as measured by a standard test, increased the chances of dying from heart disease by 29 percent in a large study of patients at Duke—and by more than 50 percent in people 60 and younger.

Even childhood trauma seems to have an impact on heart disease later in life. In a recent survey of more than 17,000 adults in San Diego, Dr. Maxia Dong at the Centers for Disease Control and Prevention found that heart-attack risk went up by 30 to 70 percent in people who reported adverse childhood experiences, such as physical, sexual or emotional abuse, domestic violence or having family members who abused drugs or alcohol. The one reassuring note: parental separation or divorce, alone among the 10 variables studied, had no statistical effect on the risk of future heart attacks.

And if stress in childhood can lead to heart disease, what about current stress-ors—longer work hours, threats of layoffs, collapsing pension funds? A study last year in *The Lancet* examined more than 11,000 heart-attack sufferers from 52 countries and found that in the year before their heart attacks, patients had been under significantly more strains—from work, family, financial troubles, depression and other causes—than some 13,000 healthy control subjects. "Each of these factors individually was associated with increased risk," says Dr. Salim Yusuf, professor of medicine at

Canada's McMaster University and senior investigator on the study. "Together, they accounted for 30 percent of overall heart-attack risk." But people respond differently to high-pressure work situations. The key to whether it produces a coronary seems to be whether you have a sense of control over life, or live at the mercy of circumstances and superiors.

That was the experience of John O'Connell, a Rockford, Ill., laboratory manager who suffered his first heart attack in 1996, at the age of 56. In the two years before, his mother and two of his children had suffered serious illnesses, and his job had been changed in a reorganization. "My life seemed completely out of control," he says. "I had no idea where I would end up." He ended up on a gurney with a clot blocking his left anterior descending artery—the classic "widowmaker." Two months later he had triple bypass surgery. A second heart attack when he was 58 left his cardiologist shaking his head. There's nothing more we can do for you, doctors told him.

Why do these stressors have such a potent effect? On the most obvious level, emotional states affect behavior. Depressed, angry people are less likely to stick with diet and exercise regimens and are more likely to smoke. In one study, the most hostile subjects consumed 600 more daily calories than the least hostile.

But behavior is only the beginning. Negative emotions can have direct effects, too, by provoking the stress response of the classic fight-or-flight mechanism. The body releases stress hormones, such as cortisol and epinephrine (adrenaline). In response, blood pressure and blood-glucose levels increase, while chemical changes in the blood enhance the clotting reaction to help heal wounds. In the short term, these are survival mechanisms. But over the long haul, chronic high blood pressure and elevated glucose damage blood vessels.

Current research focuses on the effects of inflammation. "Hostile and depressed people respond to the world in a chemically different way," says Suarez. They interpret more situations as stressful, provoking the release of more stress hormones. The immune system responds by ratcheting up inflammation, which promotes heart disease at every stage—from plaque formation to heart attack. In a 2004 study, Suarez found that people who score high on tests for anger, hostility or depression have higher blood levels of an inflammatory marker called C-reactive protein, which is strongly correlated with cardiovascular risk. "In those who were positive for all three traits, CRP levels were twice as high," he says. Similarly, Amy Ferketich at Ohio State University tested the blood of depressed versus nondepressed heart-failure patients—and found the depressed had nearly twice the levels of an inflammatory compound called TNF-alpha.

Inflammation aside, it's now clear that adrenaline itself can wreak havoc on the heart. Dr. Ilan Wittstein of Johns Hopkins recently identified a condition called stress cardiomyopathy, or "broken-heart syndrome," which looks on the surface a lot like a heart attack. Wittstein's patients had all experienced major shocks—the sudden death of a parent or child, a car accident, an armed robbery, even a surprise birthday party—and their hearts' ability to pump had suddenly weakened. Their symptoms mimicked those of a heart attack. Even their EKGs read like those of heart-attack patients. Yet these people showed no sign of blockage in their coronary arteries and very little of the blood-chemistry markers of heart-tissue death. And unlike heart-attack survivors, who take months to recover, these folks were usually fine within 72 hours. What was going on in their chests? Although there's still debate about the exact mechanism, Wittstein notes that the patients' blood levels of adrenaline were 30 times higher than normal, four to five times higher even than in patients undergoing an actual heart attack. He suspects this huge dose of a powerful hormone disrupts the way heart cells take up calcium, which is essential for heart-muscle cells to contract.

If negative or stressful emotions contribute to heart disease, could their opposites represent an avenue for treatment or prevention? Consider what happened when University of Utah psychologist Timothy Smith assigned 82 college students a task designed to cause stress. They had to argue either for or against a controversial topic, like raising the Social Security retirement age. Their responses, they were told, would be graded for clarity, organization and persuasiveness—and would be recorded on videotape. But first, they were asked to write a few paragraphs about either a close, supportive friend or a casual acquaintance. During the subsequent filming, says Smith, "Heart rate and blood pressure went up a lot. But they went up less when people spent a minute or

two beforehand thinking of someone who mattered to them." Over a period of years, the effects of having such supportive friends—and appreciating them—would be cumulative.

Optimism seems to have similar benefits, and may even help slow the progression of atherosclerosis. Psychologist Karen Matthews at the University of Pittsburgh observed 209 healthy, postmenopausal women for three years and found that the most optimistic ones had very little thickening in their carotid arteries—just 1 percent, versus as much as 6.5 percent in the pessimists.

Even laughter is starting to look like a cardiac elixir. In one recent study, Dr. Michael Miller of the University of Maryland School of Medicine found that watching a funny movie for 15 minutes relaxed people's peripheral arteries and increased blood flow for as long as 45 minutes afterward—comparable to the effect of aerobic exercise. He now recommends 15 minutes of hearty laughter daily—chuckling, giggling and smiling haven't been studied yet—as part of a healthy lifestyle.

It's natural to wonder whether other mood interventions—such as psychotherapy and drugs—would benefit heart patients. Research is limited, but there's not much evidence that traditional one-on-one psychotherapy is beneficial. At least one study has shown a possible protective effect from antidepressants—but only from the SSRIs, a category that includes Zoloft, Paxil and Prozac. Other mood-altering drugs had no effect on heart disease, which suggests the benefits from SSRIs were a biochemical side effect, unrelated to depression as such.

For now, the state of the art in psycho-cardiology is the program developed by Dr. Dean Ornish. Ornish's lifestyle regimen is best known for the stringency of its ultra-low-fat diet, but it places equal emphasis on exercise and stress reduction through yoga, meditation and support groups. Mel Lefer of Penngrove, Calif., credits it with saving his life. Lefer suffered a massive heart attack in 1985, when he was 53 years old. Overweight, a heavy smoker and a workaholic who ran three restaurants, he had also lost a son in an accident a few years earlier and had separated from his wife. Lefer's own cardiologist told Ornish not to bother enrolling him in a yearlong study because he would never live that long. Twenty years later Lefer is not just alive, but lean and energetic. And so is O'Connell, who joined an Ornish-based program at the Swedish American Health System in Rockford, Ill., after his second heart attack. Seven years have gone by since the day his doctors told him his case was hopeless.

It's ironic that psychological interventions—painless, risk-free and low-cost—are typically the treatment of last resort for heart patients who have exhausted all the possibilities of angioplasty, stents, bypass surgery and medication. "My favorite patients are those who have been told, 'There's nothing more we can do for you'," says Dr. Harvey Zarren, who runs an Ornish-inspired program at North Shore Medical Center's Union Hospital in Lynn, Mass. When he meets a new patient, he concedes that the medical options have been exhausted. Then he adds, "But here's what you can do for yourself." For two-and-a-half hours, one night a week, Zarren leads his patients in meditation, followed by yoga, relaxation exercises and a support-group session in which patients share their frustrations and accomplishments. In fact, Zarren does think there's more that medical science can do for most heart patients, but it doesn't involve fancier stents or new drugs. It's the investment of time and caring. One of the first questions he asks patients is, "With whom do you share your feelings?"

Someday that may be the model for treating heart patients: an approach that integrates lifestyle changes with a new outlook on life. It will involve a collaboration among cardiologist, nutritionist, psychologist, the patient and his family, bound together by the realization that the heart does not beat in isolation, nor does the mind brood alone.

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