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The Heart Cold Facts

It's a proven fact: almost 90 percent of twelve-year-old children in the United States show some signs of atherosclerosis, the disease that causes coronary artery disease, which means you probably have it, too!

Another equally frightening fact is that two-thirds of heart attacks occur in people who have no known history of heart disease. It's an elusive disease with a long lag time and few or no symptoms that, more often than not, strikes without warning. We should all assume that given the way we live and the way we eat, we all have some form of the disease and recognize the importance of protecting ourselves from its unpredictable and harmful course.

In my practice I'm reminded daily of the toxic effects of stress on our hearts. I see countless patients who, immediately after a stressful event, fall prey to the powerful jaws of cardiovascular disease.

The Risk Is Widespread

Examples of stressed-out patients who have been seen in my clinic include an attorney who suffered a massive heart attack on the day of her court trial, a teacher who suddenly developed congestive heart failure after being harassed by disgruntled parents, and a plumber who developed rapid palpitations and a sudden arrhythmia after being accosted unexpectedly by angry clients. In all these scenarios, anxiety from a stressful event caused a sudden flooding of stress hormones that were secreted in high enough concentrations to cause a cardiac event.

Like meteorological weather patterns in a growing tropical storm, life's stresses—whether family, personal, or work-related—can grow, gather momentum, and ultimately wreak havoc on our cardiovascular system. If unrecognized, low-level everyday stress constantly exposes our delicate cardiac tissues to toxic levels of stress hormones, which make our cardiovascular system vulnerable to heart attacks, arrhythmias, and congestive heart failure—the three most common cardiac conditions in the United States.

The most common and studied link between stress and health is with cardiovascular disease. It's estimated that more than 75 percent of visits to primary care physicians are due to stress-related disorders. The mechanisms that relate heart disease to stress are many: increased vascular resistance (higher pressure in the arteries), enhanced platelet activity (thick, clot-prone blood), hypertension (high blood pressure), coronary vasospasm (constriction that limits blood flow), inflammation, electrical instability (erratic heartbeat), and enhanced atherosclerosis (plaque buildup in the arteries). All of these will be discussed in this book.

The Costs in Lives and Dollars

Heart disease and stroke are the most common cardiovascular diseases, and they are the first and third causes of death for both men and women in the United States, accounting for more than 35 percent of all deaths.

More than 870,000 Americans die of heart disease and stroke every year, which is about 2,400 people dying every day. Although these largely preventable conditions are more common among older adults, more than 148,000 (17 percent) of Americans who died of cardiovascular diseases in 2004 were younger than sixty-five. Heart disease and stroke also are among the leading causes of disability in the U.S. workforce. Nearly 1 million people are disabled each year from strokes alone. However, the burden of heart disease and stroke shouldn't be measured only by death and disability.

More than 80 million (one in three) Americans currently live with one or more types of cardiovascular disease or have a serious risk factor that increases the likelihood of developing heart disease. This figure includes 73 million people with high blood pressure, 5.8 million who have suffered a stroke, 5.3 million who have experienced heart failure, 8.1 million who have had a heart attack, and 9.1 million who suffer from regular chest pain (angina pectoris). This year alone, more than 920,000 people will have a heart attack (myocardial infarction), and an additional 780,000 will have a stroke.

More than 6 million hospitalizations occur each year because of cardiovascular diseases. Americans also make more than 81 million doctor visits every year because of cardiovascular diseases. The cost of heart disease and stroke in the United States is projected to be more than $500 billion in 2009, including health care expenditures and lost productivity from death and disability. (In 2008 the cost was $448.5 billion.) As the population ages, the economic impact of cardiovascular diseases on our nation's health care system will become even greater.

The Triggers

As we race through life at breakneck speed, the list of stressful triggers that are linked to cardiac disease is growing. Some of the first reported examples of emotional stressors related to heart disease were depression, anger, and hostility. There's a large body of research from the early 1950s that demonstrates this relationship. More recently, however, because of our fast-paced, multitasking lifestyles, many other emotional triggers have been found to be damaging to the heart. Here are some examples:

Repressing your feelings Marital arguing patterns, for example, have been shown to be detrimental to cardiovascular health, particularly in women. The women who repressed their feelings of resentment and anger toward their husbands had a higher risk of heart attack than those who were more open and expressive of their feelings.

Panicking Panic attacks were also recently found to be linked to the risk of heart attack. In one study, the women who experienced at least one full-blown panic attack had a significantly increased risk of heart attack and stroke.

Experiencing an earthquake The Northridge earthquake that struck Los Angeles in 1994 was one of the strongest ever recorded in North America. There was a sharp increase in the number of deaths from cardiovascular disease immediately after this event, and the researchers postulated that emotional stress from the quake was the cause. Similar data were observed after a major earthquake in Japan.

Worrying while you work Ten thousand British government workers with long-term job stress were followed for twelve years. This study was the first to show that on-the-job stress could cause cardiovascular disease, either directly, from the stress itself, or indirectly, by leading stressed employees to adopt unhealthy lifestyles (such as smoking or heavy drinking). The study found that those with chronic job stress had a 68

percent higher chance of having a heart attack, developing angina, or dying from heart disease.

Having unhappy (or too happy?) holidays In a twelve-year study conducted in Los Angeles, researchers showed that cardiac death rates were consistently higher in the winter months and peaked at Christmas and New Year's. Specifically, December 25 and January 1 are the deadliest days of the year for heart attacks and sudden cardiac death. The researchers hypothesized that the peak in cardiac deaths during the holidays might be a result of emotional stress, overindulgence, or both.

Being a die-hard sports fan A study conducted in Germany showed that die-hard soccer fans had an increased risk of heart attack during championship games. When Germany played Argentina during the World Cup games, the researchers observed a threefold to fourfold increase in cardiovascular events for soccer fans. This trend was consistent whether the German team was winning or losing. The stress caused by the suspenseful and exciting games was hard on their hearts.

Feeling terrorized Researchers in Irvine, California found an increased risk of cardiovascular events in people for three years after the terrorist attack on September 11, 2001. Those who had acute stress responses to the 9/11 attacks had a 53 percent increased incidence of heart problems in the next three years and twice the risk of developing high blood pressure. People who continued to worry after 9/11 had an increased risk of heart problems two to three years after the attack.

Stress Management Improves Both Cardiac Care and Cost

An increasing number of studies, including randomized clinical trials, point to safe and relatively inexpensive interventions that

can improve cardiovascular health outcomes and reduce the need for more expensive medical treatments.

A study of patients with heart disease found that psychosocial interventions reduced the risk of further cardiac events by 75 percent, compared to the patients who were given only standard medical care and medications. A sample of 107 patients with heart disease was randomly divided into three groups (standard medical care, exercise, and stress management) and followed for up to five years for the incidence of myocardial infarction, bypass surgery, and angioplasty. The stress management group showed a marked difference compared to the other two groups: only 10 percent experienced these clinical conditions, versus 21 percent in the exercise group and 30 percent in the standard-care group.

An important component of psychological preparation for surgery involves giving patients positive physiological suggestions and imagery. In a randomized, placebo-controlled, double-blind clinical trial, 335 patients were given one of four different audiotapes to listen to before and during surgery. The placebo group listened to a tape with a neutral white noise. Only one experimental tape produced statistically significant benefits; it contained guided imagery, music, and specific suggestions of diminished blood loss and rapid healing. The patients who listened to this tape experienced a 43 percent reduction in blood loss and were able to leave the hospital more than a day earlier than the other groups.

The Chronic Disease Self-Management Program, developed jointly by Stanford University and Kaiser Permanente, includes educational group sessions for patients with chronic disease. The intervention consists of a patient handbook and seven weekly two-hour small-group sessions that focus on developing practical skills to cope with common symptoms and emotions. In a randomized clinical trial of 952 patients, those who participated in the course, compared to the wait-listed control subjects, demonstrated significant improvements at six months in weekly minutes of exercise, self-reported health, health distress,

fatigue, and disability. They also had fewer hospitalizations and spent an average of 0.8 fewer nights in the hospital. Assuming that a day in the hospital costs a thousand dollars, the health care savings were approximately $750 per participant—more than ten times the cost of the program.

Not only does stress management appear to reduce the long-term chances that heart patients will have another cardiac event, a new analysis by the Duke University Medical Center and the American Psychological Association demonstrates that this approach also provides an immediate and significant cost savings.

The medical outcomes in this study were notable. Patients in both the exercise group and the standard-care group averaged 1.3 cardiac events—bypass surgery, angioplasty, heart attack, or death—by the fifth year of the follow-up. Those in the stress management group, in contrast, averaged only 0.8 such events during the same period.

The research team found a financial benefit of stress management strategies within the first year of the study. The average cost for the patients who utilized stress management were $1,228 per patient during the first year, compared to $2,352 per patient for those who exercised and $4,523 per patient for those who received standard medical care.

Moreover, the researchers found that the financial benefit of stress management was maintained over time. The average cost rose to only $9,251 per patient during the fifth year for those who used stress management strategies, compared to $15,688 per patient for those who exercised and $14,997 per patient for those who received standard medical care. The average cost per patient per year during the five years was $5,998 for those who used stress management, $8,689 for those who exercised, and $10,338 for those who received standard medical care.

Thus, the benefits of stress management seem to exceed the benefits of both exercise and standard medical care in the reduction of cardiac events *and* in financial costs.

There is now a large body of research that links stress to heart disease, and there is an equally impressive and growing body of evidence of the effectiveness of stress management for successfully treating heart disease. Thus, it seems prudent that clinical interventions should better reflect the emerging evidence of the efficacy and cost-effectiveness of stress management for the treatment of heart disease. Stress management techniques such as B-R-E-A-T-H-E should be an integral part of evidence-based, cost-effective, high-quality health care.

The Data-Treatment Paradox

The substantial evidence of the relationship of stress and heart disease has health care workers, and cardiologists in particular, paying attention. Yet despite this growing body of research, some cardiologists still aren't completely convinced. Why have cardiologists been so reluctant to acknowledge the significance of stress and its relationship to heart health? The role of stress in causing heart disease is still hotly debated in cardiology for two reasons:

1. *Stress is a subjective concept that may be unique to the individual.* What's stressful for one person may not be stressful for another. Some people who are thrill-seekers jump out of airplanes at ten thousand feet and find it pleasurable, whereas others are scared of heights and prefer to keep their feet planted firmly on the ground.
2. *Stress is difficult to measure.* It typically strikes without warning and is difficult to reproduce in a laboratory. After all, how can you measure or control for stress in order to accurately measure its affect on health?

Although most cardiologists believe that stress and heart disease are probably related, they're ambivalent and insecure about discussing the importance of the relationship with their

patients. I believe that their ambivalence and lack of acceptance may be due to the following factors:

- A lack of knowledge about supportive data on the relationship between stress and heart disease
- A lack of knowledge about supportive data on the beneficial effects of stress management on cardiac risk
- A lack of motivation to teach stress management due to time constraints
- A perception that stress management methods are ineffective
- A lack of knowledge of how to teach patients specific interventions
- A belief that stress and stress management are not related to their area of expertise
- Poor or no reimbursement for the time spent with patients to explore stress and how it relates to their heart problem.

What cardiologists do agree on is our body's response to stress and the destructive nature of chronic exposure to potentially toxic levels of the stress hormones adrenaline and cortisol.

A Change of Heart

Three recent scientific discoveries that relate stress to heart disease have cardiologists around the world sitting up and taking notice. These measurable, irrefutable, and solid scientific phenomena are as follows:

1. *Neuroimaging* Special neuroimaging techniques, such as magnetic resonance imaging (MRI) and positron-emission tomography (PET) scanning, have allowed us for the first time to visualize the workings of the brain and the heart

under stress. Stress causes a certain part of the brain to become metabolically active, which can be directly imaged using a fancy head scanner known as a PET scan. When subjects with heart disease are given a mental stress test, such as a difficult math problem, their stress hormones become elevated, and the stress portion of the brain lights up on the scan. At the same time, the stress hormones that are released by the anxiety of dealing with the math problem cause the heart to work harder, thus increasing the pulse and the blood pressure and resulting in chest pain or angina. This pattern is reproducible; it confirms the heart-brain connection and illustrates that stress and heart disease are linked.

2. *The broken-heart syndrome* Another piece of evidence that has caught the attention of cardiologists is the broken-heart syndrome, also known as Takotsubos syndrome. *Takotsubo* is Japanese for "octopus trap." In this syndrome, when the left ventricle of the heart is damaged, the muscle resembles an octopus trap (with its characteristic rounded bottom and narrow neck). For centuries, literary works have been filled with descriptions of characters being stricken by heartache and dying from a broken heart. It turns out that this age-old belief may be scientifically correct.

   The broken-heart syndrome is not restricted to disappointment in love. Extreme grief (such as mourning the death of a loved one) or extreme fear (from being held at gunpoint, being in a car accident, or having to speak in public) are common examples. Even just a stressful argument or a bout of road rage will suffice. In any of these cases, an acute emotional stressor leads to severe, temporary dysfunction of the main pumping chamber of the heart. People who are affected by this peculiar syndrome have surges of stress hormones that cause immediate and measurable destructive changes in the main pumping chamber (the left ventricle). These changes are identical to those caused by a massive heart attack, yet they are reversible.

Those who suffer from this syndrome are usually female and without previous cardiac history. They suddenly experience chest pain and/or shortness of breath after experiencing an acute emotional or physical stress. People with such stress-induced cardiomyopathy have markedly elevated blood levels of adrenaline and noradrenaline.

Although the initial reports of this syndrome were all from Japan, broken-heart syndrome has now been reported in people all over the world. Although the syndrome affects only a small number of people, it clearly shows that a stressful emotional trigger can lead to a flooding by stress hormones and a cardiac event.

3. *Stress as an independent risk factor* A large study at the University of Southern California followed six thousand patients for five years and found that stress and anxiety were better predictors of future cardiovascular events than other traditional risk factors. This is groundbreaking, because it suggests that stress is not simply related to heart disease, it is *independently predictive* of heart disease, just as diabetes or high cholesterol is. This study even showed that patients who were able to reduce their stress level or keep it steady over time were 50 to 60 percent less likely to have a heart attack than the patients whose stress levels increased.

As more and more cardiologists acknowledge the effects of stress on heart disease, an even greater emphasis will be placed on specific stress management techniques like B-R-E-A-T-H-E, which has been specifically designed to decrease cardiac risk.

Is Relaxation Good?

The data clearly suggest that stress is bad for our heart by causing damage from the toxic flooding of the stress hormones adrenaline and cortisol.

If stress is bad for the heart, is relaxation good? The answer, as you might expect, is absolutely yes!

Many of the physiological effects of relaxation are the exact opposite of the stress response. Whereas stress causes your heart rate to rev up and your blood pressure to soar, relaxation causes your heart rate to slow down and your blood pressure to fall. Whereas stress makes you feel anxious, jittery, and sick to your stomach, relaxation makes you feel calm, steady, comfortable, and at peace.

No one can completely avoid stress, but you can counteract it by learning how to evoke the relaxation response, a state of deep restfulness and the polar opposite of the stress response. The relaxation response rests and rejuvenates your body by restoring balance and reducing toxic levels of stress hormones. By consistently activating the relaxation response, the body can begin to repair the damage caused by stress.

Some of the most compelling demonstrations of the positive benefits of relaxation therapy come from Dr. Dean Ornish's five-year study, the Lifestyle Heart Trial (LHT), in which people who made intensive changes in diet, exercise, and stress management had a greater reversal of cardiovascular disease than those who followed a less intense regimen recommended by the American Heart Association (AHA). Those who followed the LHT program had a 37 percent reduction in bad cholesterol, less frequent chest pain, and fewer blockages in the coronary arteries. There were also twice as many cardiac episodes in the AHA program as in the LHT program.

A similar study at Boston's Massachusetts General Hospital, conducted by Dr James Blumenthal, demonstrated that patients with diagnosed heart disease were able to decrease their cardiovascular risk by learning and practicing stress management skills for only sixteen weeks. The patients in the stress management group also had significant increases in heart-rate variability compared to the patients who received standard medical care for coronary heart disease.

Furthermore, after I witnessed thousands of anxious patients about to undergo invasive cardiac procedures, I thought it was important to provide a way for my patients to relax prior to surgery. I therefore designed a study using guided-imagery audio CDs in an attempt to allay patients' preoperative fears. The audio CDs included information about what to expect before, during, and after the procedure and instructions on how to relax by using breathing exercises and visualization. The patients listened to the relaxation CDs before and after the procedure. The results were that the patients who listened to the relaxation CDs felt less anxious, better informed, and generally more satisfied with their care and their doctor. Thus my hunch was correct. When patients felt more relaxed and better informed about their procedure, they reported feeling much less anxious. In addition, the patients who listened to the relaxation CDs had lower blood pressure and a slower heart rate, which may indirectly represent a lower level of stress-hormone release.

Another study showed that patients who were using guided imagery for cardiac surgery had a faster recovery and a decreased length of hospital stay. In 1998, the cardiac surgery team implemented a guided imagery program to compare cardiac surgical outcomes between two groups of patients: with and without guided imagery. Hospital financial data and patient satisfaction data were collected and matched with the two groups of patients. A questionnaire was developed to assess the benefits of the guided imagery program to those who volunteered to participate in it. The patients who completed the guided imagery program had a shorter average length of stay, a decrease in average direct pharmacy costs, and a decrease in average direct pain-medication costs while also maintaining high overall satisfaction with the treatment and the care. Guided imagery is now considered by doctors to be a complementary means of reducing anxiety, pain, and length of stay for cardiac surgery patients.

Summary of Data Supporting the Use of Stress Management and Relaxation Techniques to Decrease Cardiovascular Risk

- Patients who had experienced heart attacks and who were taught relaxation therapies experienced fewer cardiac events in a five-year period. These therapies were taught for only one hour a day for six weeks, and the results were long-lasting.
- An analysis of twenty-seven studies showed that patients with coronary heart disease who were taught relaxation techniques had slower, steady heart rates as well as less angina, fewer arrhythmias, and a lower rate of cardiac events and cardiac death.
- Patients with coronary heart disease who used biofeedback were shown to increase heart-rate variability, which is a measure of the opposite of the stress response. Biofeedback is a form of relaxation therapy that teaches control of breathing, heartbeat, and blood pressure. Biofeedback is used to combat anxiety disorders and chronic stress.
- Meditation was found to stabilize the heart muscle, making it less irritable and decreasing the number of skipped beats (known as ventricular premature contractions).
- Multiple studies have found that yoga decreases blood pressure in people with high blood pressure.
- Hypnosis was found to stabilize the heart muscle during emotional stress.
- Breath work that involved slow deep breathing was found to lower blood pressure in patients with high blood pressure and to increase heart-rate variability (a measure of the relaxation response) in patients with coronary heart disease.

The data that support the use of relaxation and stress management to decrease cardiovascular risk are growing, but simple

techniques are unfortunately few and far between, which is why the B-R-E-A-T-H-E technique is so timely and vitally important.

The Heart: Your Body's Engine

Your heart is a simple pump with four components that work synchronously to maintain the flow of blood to your body's tissues. The four components of the heart are (1) the arteries, the tubes that carry oxygen to the heart muscle; (2) the valves, the doorways that connect the four chambers of the heart; (3) the muscle, the tissue that contracts and propels the blood to the body's tissues; and (4) the electrical system, the internal wiring that creates the rhythm and pulse of the heart.

The heart is like a high-performance engine that requires regular maintenance and servicing. When a part becomes rusty or a spark plug is out, for example, a car is prone to stall, make funny noises, and run poorly. Ignoring the car's need for regular oil changes and general upkeep can lead to periodic breakdowns and eventual engine failure. The heart has similar needs. When part of the heart has a problem, we develop warning signs known as symptoms. Like the engine light in a car, these signs are telling us that our heart needs urgent attention.

A cardiologist, like a good mechanic, analyzes the symptoms, performs the appropriate diagnostics, and troubleshoots to identify the ailing part. The four conditions described below highlight the symptoms that occur when problems arise in each of the four parts. The problems with each of the components correlate with the four most common cardiac conditions.

If the heart had an owner's manual, it would require you to use specific tools to maintain the heart's efficiency. These tools are diet, exercise, and stress management. This book focuses on stress and a specific stress management technique known as cardiac-specific mental imagery. Unlike your neglected car, which can be traded in for a new one when it breaks down, your

heart is far less exchangeable. Ignoring the negative effect of stress on your heart poses the risk of irreparable and potentially lethal cardiac damage.

Stress is to the heart what speeding in a residential area is to a car engine: dangerous and hard. Stress management for the heart is like an oil change for a high-performance car. It will serve to keep the heart and the engine running healthy and efficiently.

Two cars of the same make and model are stuck in traffic. One is well maintained, and one is neglected—its service light is on, indicating the need for immediate care. Both cars look shiny and new on the outside. However, looks are deceiving. One car has been serviced and maintained properly to protect the engine from the wear and tear of stop-and-go traffic. The other has been overused and overrun in overdrive with zero maintenance and care, making the engine destined for failure.

Which car is yours?

Like Ice in Their Veins

What do golf champions, Olympic athletes, firefighters, and surgeons have in common? They all display an uncanny ability to focus and execute in the face of adversity, or what most people would consider to be extraordinarily stressful situations.

They seem unaffected by the sheer chaos and mayhem around them. They filter out the extraneous information, the kind that frazzles most humans. They act calmly and coolly, as if they had ice in their veins. How do they do this? Are they genetically superior? Do they possess special gifts? Finding calm in the storm seems almost reflexive to them but is in fact the result of repetition, commitment, and practice. Athletes, surgeons, and firefighters practice regularly so that their seemingly superhuman task is effortless.

This ability, though seemingly extraordinary, is an attribute attainable by all. So, relax, don't worry if you've been accused of being

stressed out, neurotic, obsessive-compulsive, or a workaholic. The research in neuroscience has proven that contrary to popular belief, you can indeed teach an old dog a new trick.

Common to all these examples is the commitment to practice, rehearsal, and visualization. Athletes, surgeons, and firefighters imagine the goal, rehearse it in their mind, and then execute it perfectly. When faced with the stressful situation, they call on this muscle memory, which occurs almost reflexively and unconsciously. Athletes describe this state of focus as being "in the zone." Everything around them is in slow motion, which allows them to perform with precision, accuracy, and calm, exactly as rehearsed.

Guided mental imagery is a highly successful and powerful technique that can yield positive results after only a few sessions. My patients have reported feeling a sense of calm and focus after only a single trial. I emphasize to my patients, however, that the greatest benefits can be achieved with practice and commitment. The more dedicated you are to the practice, the more rapidly you will gain mastery of the technique and be able to achieve a sense of calm when you're faced with one of life's unexpected challenges.

More frequent practice will also increase the likelihood of forming cardio-protective emotional memory and ingrained neuron-cardiac nerve networks that will bathe your heart in protective, nurturing, and calming hormones. This ability to find calm in the storm of hormonal stress is what I call opening your heart eyes and becoming heart wise.

How This Book Works

Each chapter in the book details a cardiac condition. Each is illustrated with a story based on real patients (whose names have been changed) and a stressful life event that preceded the onset of their symptoms. Following each example is a cardiologist's analysis, including the diagnosis, the treatment, and the

management of the condition. Each chapter concludes with a disease-specific meditation and mental imagery that is metaphorically related to the cardiac condition discussed.

The following are the four most common cardiac conditions:

- *Arrhythmia* This is an abnormal, erratic heart rhythm caused by a diseased electrical system. Arrhythmias can be slow, fast, or erratic. They typically cause symptoms of palpitations, light-headedness, and difficulty in breathing.

  Atrial fibrillation (AF) is the most common disturbance of heart rhythm, and it increases the risk for stroke, heart failure, and all heart-related causes of death, especially in women. AF presently affects more than 2 million Americans and 4.5 million Europeans. The number of patients with AF is expected to increase even more as our elderly population increases.

- *Angina and heart attack* The arteries are three small tubes, no wider than the diameter of a pen or a pencil, that carry precious oxygen from the lungs to the heart itself. In the process we call coronary artery disease, these tubes become progressively narrowed, the muscle is deprived of oxygen, and the person experiences chest pain or angina. When the artery is completely blocked, the blood stops flowing to the heart muscle, and the heart muscle dies in what we call a heart attack.

  According to the Centers for Disease Control in 2006, 24.7 million adults (equivalent to 11.5 percent of the U.S. adult population) have been diagnosed with heart disease.

- *Congestive heart failure* This condition is caused by a severely weakened heart muscle, known as a cardiomyopathy, where the heart becomes unable to contract forcefully enough to deliver blood (and oxygen) to the tissues. In response to the weakened muscle, the blood in the heart becomes congested and, instead of moving forward to the body's tissues, begins to move backward

into the lungs, which causes difficulty in breathing. An estimated 5 million Americans currently have congestive heart failure. There are more than four hundred thousand new cases a year, and it's the leading cause of hospital admissions in patients older than sixty-five. The trend has increased threefold in the past decade and is rising.

- *Valvular heart disease* When the valves, the doors that connect the four chambers of the heart, fail to close properly, they tend to leak or regurgitate. If the hinges become rusty (stenosed, or afflicted with stenosis), the doors don't open properly and pressure backs up like a clogged drain in a sink. The symptoms of valvular heart disease are difficulty in breathing, chest pain, and even passing out.

  Aortic stenosis is the most common valve disease. In Scotland, a recent study reported that aortic stenosis is the most common adult heart-valve disease in the Western world. It increases in prevalence with advancing age, afflicting 2 to 3 percent of the population by the age of sixty-five, and its incidence continues to rise.

Your Heart of Gold

Your heart is precious and should be treated with care and regular maintenance. It's arguably your body's most important organ, and a healthy cardiovascular system is essential for enjoying optimal health.

We've made tremendous strides in advancing the technology for cardiovascular care. Devices such as coronary stents, special pacemakers with fancy whistles and bells, and potent pharmaceuticals have all helped to fight heart disease—the number-one killer in America. These therapies are worth every penny, but the cost is still staggering.

Less glamorous yet cost-effective and equally important cardioprotective therapies are exercise, diet, and stress management

techniques like the one described in this book. We need to recognize the importance of the latter and make it part of our regular care for the treatment of cardiovascular disease.

Have *a heart of gold.* Learn this simple, cost-effective stress management technique and then teach it to your family members and your friends. Educate them about the powerful negative effects of stress on our cardiovascular system and about the positive, calming, and beneficial cardiovascular effects of B-R-E-A-T-H-E!

By practicing the exercises and techniques herein for fifteen minutes a day, you'll develop the ability to recall the imagery in these exercises when you're faced with an unexpected life stress, and it will protect your heart from the cardio-toxic surge of stress hormones.