

# **Taking it to Heart: the Prevention and Treatment of Heart Disease**

**What is heart disease, how do I prevent it, and how can I treat it if I have it?**

**By Miriam Ruff**

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## ***ARE YOU A STATISTIC?***

In 1999, coronary heart disease (CHD), the condition that causes both heart attacks and angina, was the single leading cause of death in the United States. 529,659 people died from this disease (one out of every five deaths). In addition, according to the National Heart, Lung, and Blood Institute (NHLBI), Americans were diagnosed with 1.1 million new and recurrent cases of coronary attack. Not just an American problem, though, CHD ranks as one of the major causes of death in countries around the globe. Are you at risk? Is there any way you can prevent it from happening? And is there anything you can do if it occurs?

## ***HOW THE HEART WORKS***

Before you can address these issues, it's important to know a bit about how the heart works and why it's so important to the body.

The normal heart is a muscular "pump" just slightly larger than a fist. It contains four chambers that force blood into the rest of the circulatory system. The upper two chambers are called the right atrium and the left atrium; the lower two are called the right and left ventricles. Four valves open to let blood flow through and then close to prevent a backflow, in a highly coordinated sequence.

These valves are:

- The tricuspid valve, located between the right atrium and the right ventricle
- The pulmonary valve, located between the right ventricle and the pulmonary artery
- The mitral valve, located between the left atrium and the left ventricle

- The aortic valve, located between the left ventricle and the aorta

Each valve contains a set of flaps, also known as "leaflets" or "cusps." When a difference in pressure occurs across the valves, it causes these flaps to open, forcing blood in one direction only – into the body.

To work effectively, the four separate chambers have to beat in an organized manner. This is accomplished by "pacemaker" signals – electrical impulses generated by highly specialized nerve cells. The signals start in a small bundle of cells known as the sinoatrial (SA) node, located in the right atrium, then spread to the atrioventricular (AV) node, which is the region between the atria. This node in turn connects to a group of special pathways that conduct the signals to the ventricles below. As the signals travel, the heart contracts – the atria push blood into the ventricles, which then send it through the rest of the body.

Although the signals normally occur at a given, steady rate, other factors such as emotional responses and hormonal changes can affect them. Within limits, this is not a dangerous situation – it lets the heart adapt to the body's varying needs. However, in the case of a heart attack or a number of other chronic conditions, the impulses become erratic and the heart no longer beats in a coordinated fashion. In these cases doctors must install an artificial pacemaker to restore proper function.

The heart beats continuously, about 70 to 90 times per minute in the average person. That translates into about 100,000 times per day, pumping the equivalent of 2,000 gallons of blood through the body.

The circulatory system consists of a vast network of tubes that carries the blood to and from all parts of the body. The heart, lungs, arteries, arterioles (small arteries), and capillaries (very tiny blood arteries, also called vessels) carry oxygen- and nutrient-rich blood away from the heart to the rest of the body. The veins and venules (small veins) carry oxygen- and nutrient-depleted blood back to the heart and lungs. If all these vessels were laid end-to-end, they would extend about 60,000 miles.

## ***WHAT IS HEART DISEASE?***

Heart disease occurs when something interferes with the heart's ability to pump blood efficiently. Heart attacks are usually not a cause but a symptom of an underlying disease or condition. They occur when that condition cuts off the blood supply from a region of the heart, causing the muscle tissue to die. In about one-third of cases, this attack is a person's first indication that something is wrong.

Heart attacks can be sudden and intense – you experience an abrupt increase in pain and pressure, or you may simply keel over. But what many people don't realize is that most heart attacks actually start slowly, with mild pain or a sense of discomfort. Often they aren't sure what, if anything, is wrong, and as a consequence they do nothing about it until it's too late.

There are a number of warning signs, though, which can help you determine whether you may be experiencing a heart attack. If you experience any of them, IMMEDIATELY call rescue personnel or your doctor, or have someone get you to an emergency room.

These signs include:

- Chest discomfort. This discomfort may present as pressure, squeezing, or bloating pains in the center of the chest, all of which either last more than a few minutes or go away and

then come back.

- Discomfort in other regions of the upper body. The discomfort often appears on the left side (since the heart is on the left), but it may spread to one or both arms, the back, neck, jaw, or stomach. Often times it radiates from the chest area down the left arm or side of the body.
- Shortness of breath. This may occur along with or before the chest discomfort.
- Additional problems. These may include breaking out in a cold sweat, nausea, or a feeling of lightheadedness.

Angina pectoris is another common manifestation of heart disease that results from incomplete blockages in the arteries supplying blood to the heart. It feels like a squeezing pain or pressure in the chest, sometimes accompanied by shortness of breath. If the pain is mild, it may go away after a minute or so of rest; if it is more severe, medication (such as nitroglycerin) may be required.

For some people, angina attacks occur with a certain level of activity and they go away easily. These come-and-go episodes are known as stable angina. When the pattern of angina changes a lot, or when it does not go away easily, it is known as unstable angina. Unstable angina may be the first sign of an impending heart attack.

Arrhythmias are changes in the regular beat of the heart; the heart may seem to skip a beat or beat very quickly or very slowly. Most of the time such changes are not serious and no treatment is required, but in some cases they can be the result of underlying disease. It's usually the heart disease, though, and not the arrhythmia, that poses the greater risk.

## ***WHAT CAUSES HEART DISEASE?***

Heart disease can be caused by any number of conditions, some genetic and some environmental.

Several of the most common ones include:

- Atherosclerosis. Also known as "hardening of the arteries," atherosclerosis affects the blood vessels that carry oxygen and blood to the body's muscles. Normally these arteries are very elastic, expanding and contracting easily as the volume of blood passing through them changes. However, fatty materials such as cholesterol can build up on the walls inside the arteries, making them narrow and hard. When this happens, not enough blood and oxygen can reach the muscles. As a result, the tissues die. This hardening can occur anywhere in the body. When it happens in the heart or the vessels leading to it, a heart attack results. When it happens in the vessels leading to or within the brain, a stroke results.

Cholesterol is normally present in the body; the cells manufacture a certain amount to use for structural purposes. However, most people who develop atherosclerosis do so because of a diet high in fat and additional cholesterol. Since the body already has most of what it needs, this added material has nowhere to go, and it collects on the artery walls.

- Mitral Valve Stenosis. This is a condition in which the mitral valve, the valve that connects the heart's upper-left atrium to the lower-left ventricle, narrows. As a result, the valve doesn't open properly and obstructs the blood flow between the chambers. The oxygen-rich blood then can't reach the rest of the body. This causes fatigue and shortness

of breath, among other problems.

The main causes of mitral valve stenosis are rheumatic fever (a childhood disease related to strep infections) and congenital defects. The problems usually become evident in people between 20 and 50 years old. Many people experience only mild symptoms. If the condition is severe enough, surgery may be required to repair or replace the valve. Left unchecked, it can lead to serious heart complications.

- **Congestive Heart Failure.** This condition rarely develops suddenly. It's almost always a chronic ailment that results from other cardiac problems that damage or weaken the heart (such as atherosclerosis, heart attack, or high blood pressure), forcing it to work harder. The heart's ability to pump blood declines, and it can't circulate enough blood to meet the body's ongoing needs. Blood begins to pool in the legs, feet, and ankles; the kidneys retain excess water and sodium; and fluid backs up in the lungs, leading to shortness of breath and eventually to complete heart failure.

According to NHLBI, an estimated five million Americans currently live with congestive heart failure. And because the disorder becomes more common with age, it is estimated that another 15 to 20 million people will develop it in the next five years.

## ***HOW CAN I MANAGE MY RISK?***

Heart disease can strike anybody, at any time. There are, however, a number of factors that increase a person's risk. Knowing what these factors are will allow you to take steps to prevent problems before they become irreversible.

These factors (and their preventive responses) include:

- **Risk Factor: Smoking.** Cigarette smoking greatly increases the risk of both fatal and nonfatal heart attacks in men and women. It also increases the risk of having a second heart attack among survivors.
- **Prevention:** The good news is that people who quit smoking greatly reduce their risk of having either a first or a second heart attack. A year after quitting, the risk drops to about one-half that of current smokers, and in people without heart disease it gradually returns to normal. Even in people who do have heart disease, the risk also drops substantially after a year and declines further over time, although it never completely returns to normal.
- **Risk Factor: Weight.** Being overweight or obese increases the risk of having a heart attack because the heart constantly needs to work harder to pump blood through the body. In addition, excess weight increases the risk of developing high blood cholesterol, high blood pressure, atherosclerosis, and diabetes, each of which also increases the chance of having a heart attack. In 1999, the National Institutes of Health (NIH) estimated that almost 108 million Americans (about 61 percent of adults) were overweight or obese.

There are two effective ways to determine whether you are overweight:

1. **Body mass index (BMI).** This is a measure of your weight relative to your height. You can calculate your BMI by using an online BMI calculator offered on many health web sites, or by following this formula: Divide your weight (in kilograms) by your height (in meters, squared), or multiply your weight (in pounds) by 705, then divide by your height (in inches) twice.
2. **Waist circumference.** This is a measure of abdominal fat. According to the NIH, the risk

of developing heart and other diseases increases with a waist circumference of more than 40 inches in men and more than 35 inches in women. Researchers have found that this "spare tire" effect may actually be more important than overall obesity in predicting heart problems. Men with the highest waist-to-hip ratio (the circumference of the waist divided by the circumference of the hips) had a nearly three-fold risk of coronary events compared to men with lower waist-to-hip ratios.

- **Prevention:** The surest way to lose weight (or to prevent additional weight gain) is to eat sensibly, something that many people find difficult to accomplish in our fast- and junk-food oriented society. Sensible eating, though, does not mean consuming nothing but lettuce and carrot sticks. It means eating balanced meals with reasonable portions and not resorting to crash diet programs that stress the body more. If you're uncertain how to approach such a plan, consult with your doctor or a nutritionist.

One additional dietary note – it's also important that you watch your sodium intake. Salt plays an important role in regulating heart and nerve functions, but eating too much can affect those functions, leading to high blood pressure and other problems. Check the sodium content of pre-packaged foods, and try to use other herbs and seasonings to boost the flavor of the foods you prepare yourself.

- **Risk Factor:** Lack of exercise. Along with poor eating habits, many Americans fall prey to the "couch potato" syndrome, exercising intermittently, if at all. A sedentary lifestyle (especially when combined with overeating) not only increases a person's weight but also increases the risk of developing high blood cholesterol, high blood pressure, atherosclerosis, and especially type 2 diabetes (also known as "adult onset" or "non-insulin dependent").

- **Prevention:** Engaging in regular physical activity to burn off excess calories is important in maintaining a healthy weight. Physical activity not only reduces the risk factors described above, but it increases physical fitness, promotes psychological well-being and self-esteem, and reduces depression and anxiety, leading to better health overall.

To protect your heart, you need to engage in only about 30 minutes of a moderate-intensity activity every day. Even if you're not inclined to go bicycling or swimming (two great activities), you can start to increase your activity level with small changes, such as:

- Taking the stairs up one or down two flights instead of using an elevator
- Parking your car a few spaces farther away from your destination and walking the extra distance
- Taking the dog for another brisk walk around the block

And if you can't manage 30 minutes of sustained activity at a time, you can still benefit if you break up the time into periods of at least ten minutes each.

If you're over age 55, have been inactive for a long time, or have diabetes or another medical condition, don't try to do too much all at once. Start slowly and build up your tolerance to exercise, gradually increasing the amount of time you spend on it each day and the degree of difficulty of the activities you do. It's also a good idea to consult with your doctor about what types of exercise would benefit you the most.

- **Risk Factor:** Diabetes mellitus. Diabetes occurs when the body becomes unable to use glucose (a sugar obtained from food) for its energy and growth needs. Type 2 diabetes occurs gradually and most often in people over 40 years old. As mentioned earlier, you're

more likely to develop the disorder if you're overweight, especially with extra weight around the middle. Diabetes is also particularly prevalent among African Americans, Asians, and Native Americans.

Along with poor sugar regulation, diabetes damages blood vessels, including the coronary arteries of the heart. The NIH estimates that up to 75 percent of the 16 million affected Americans can expect to develop heart and other blood vessel diseases. It can also lead to stroke, kidney failure, glaucoma (an eye disease that causes blindness), and a number of other problems.

- **Prevention:** Research shows that the same steps that reduce the risk of heart disease also lower the chance of developing type 2 diabetes. And, for those who already have it, those steps, along with prescribed medications, can delay or prevent complications.

According to the NIH, for people at high risk, losing just 7 percent of body weight and engaging in 30 minutes per day of moderate-intensity physical activity can reduce the chance of developing type 2 diabetes by 58 percent. These lifestyle changes cut the risk regardless of age, ethnicity, gender, or starting weight.

- **Risk Factor: Anger and Stress.** A study published in the May 2000 *CIRCULATION: JOURNAL OF THE AMERICAN HEART ASSOCIATION* concludes that a person who is the most prone to anger is about three times more likely to have a heart attack or experience sudden cardiac death than someone who is the least prone.

This may be due, in part, to the action of stress hormones. Heart attacks can occur when a blood clot that forms on a fatty plaque blocks the flow of blood. Stress hormones constrict blood vessels and may therefore make the plaque more prone to rupture, releasing the clot into the bloodstream.

- **Prevention:** Although it's easier said than done, learning how to manage your stress is one of the keys to preventing heart-related (and many other) problems. Stress management courses, psychological counseling, and anger-management support groups are all possible avenues to explore. They can help you to develop better coping skills when you're confronted with anger-provoking situations.

It's important to note that many people who have already experienced a heart attack are also prone to anxiety and depression. Often patients feel as if a part of them has died, and they may mourn its loss and the loss of their former life. Although it may not be true, people often expect their lives to be changed immeasurably for the worse following a heart attack. That expectation, combined with not knowing what they will face in the coming months and years, can create its own anxiety. Again, support groups exist both for patients and their family members, and most hospitals have (or can refer you to) patient education programs.

- **Risk Factor: Family History.** People with a family history of heart disease, high blood pressure, or stroke have an increased risk of developing heart disease themselves.

- **Prevention:** While there is unfortunately nothing you can do to change your family history, you need to make your doctor aware that such a history exists and to pay particular attention to all the risk factors that you can control. By taking charge of your health care, you are well on your way to preventing a problem before it starts.

## ***HOW IS HEART DISEASE DIAGNOSED?***

In many cases, heart disease can be detected before something as severe as a heart attack occurs.

Some tests include:

- An electrocardiogram, (abbreviated EKG). This is a simple test that can show if your heart has been damaged by a previous heart attack, if you have an arrhythmia, or if another problem exists that interferes with the normal beat pattern. Electric leads are placed on specific parts of your chest. The pattern of your heart's electrical impulses shows up on a monitor. If the EKG is done while you're experiencing chest pain, it can also determine if the pain is caused by a problem with your heart or if it's the result of something else.
- A stress test. The next step after an EKG may be a radionuclide stress test, a type of nuclear imaging test that shows how well blood flows to the heart muscle. It's usually performed along with a treadmill or a bicycle exercise test.

During this test, you exercise until you reach your maximum exertion, at which point a small amount of radioactive thallium is injected into your bloodstream. The thallium mixes with the blood and flows into the heart muscle cells. If a part of the heart doesn't receive a normal blood supply (such as occurs with a blockage), less than a normal amount of thallium will be present in those cells. A special camera (called a "gamma camera") can image the cells and see where the thallium ends up. You then lie quietly for 2 to 3 hours, and then a second set of images is taken to see the blood flow to the heart while it's at rest.

Some people can't perform an exercise test because they're too sick or have other physical problems. In these cases, a drug such as dipyridamole is given. This drug increases blood flow to the heart, causing it to mimic its action during exercise. After that, the thallium test is performed.

- Cardiac catheterization. In this test, a very long, thin tube is inserted through an artery in the arm or leg and then guided into the heart. Once in place, a dye is injected into the arteries around the heart and X-rays are taken. The X-rays show if there is a blockage in any of the arteries that supply the heart.
- Echocardiogram (also referred to as diagnostic cardiac ultrasound examination). This is a noninvasive, safe, and usually painless test that uses special crystals located in a transducer device. These crystals generate high-frequency sound waves inaudible to the human ear that can be aimed at and reflected back from the tissues of the heart. This is the same type of procedure as the one used to generate pictures of a fetus in its mother's womb.

These images enable doctors to observe the heart's chambers, its movement, the shape and thickness of the chamber walls, the valves, and the large veins and arteries leading to and from the heart. Some specialized techniques even permit the doctor to view blood flow. With these results the doctor can diagnose many common heart problems. This test is especially useful in evaluating the function of the left ventricle (the main pumping chamber).

## ***HOW IS HEART DISEASE TREATED?***

By the time many people consider preventive measures, it's too late – they have a heart attack or stroke and need treatment. The first hours after a heart attack are the most critical. If you experience any warning signs, get help immediately.

Following a heart attack, there are a number of short- and long-term treatments that can help patients not only to recover, but also to prevent another attack from occurring.

These include:

- Coronary (or balloon) angioplasty. This procedure is used to re-open a narrowed or blocked artery. A fine tube (catheter) is threaded through an artery into the narrowed heart artery. This catheter contains a tiny balloon at its tip, which is repeatedly inflated and deflated to stretch the artery and hold it open, thereby improving blood flow. The balloon is then deflated one last time, and the tube is removed.

Often doctors insert a permanent device known as a stent during the angioplasty procedure. This is a wire mesh tube used to ensure that the artery remains open. Sometimes, though, the mesh itself can serve as a magnet for further plaque formation, and the artery once again becomes narrowed or clogged. Arteries that re-close can be re-opened with another angioplasty or a bypass graft, but these are invasive procedures. Researchers continue their work to develop improved coatings for the stents, ones that are better able to resist plaque buildup.

- Coronary artery bypass graft operation. Better known as "bypass surgery," this procedure uses a piece of a vein taken from the leg, or of an artery taken from the chest or wrist. This piece is attached to the clogged heart artery above and below the narrowed area, making a detour through which blood can flow freely. Double-, triple-, or quadruple-bypasses are procedures that require more than one graft.

Even though it is more invasive and requires a greater recuperation time, bypass surgery may be required for a number of reasons, such as when an angioplasty fails to widen the blood vessel sufficiently or when that procedure can't reach the blockages. In some cases, bypass surgery may actually be preferred, such as with patients who have both coronary heart disease and diabetes. As with an angioplasty, a bypass can also re-close. This happens in about 10 percent of such surgeries, usually after ten or more years.

- Medication. There are a number of medications that physicians commonly prescribe, including:
  - Aspirin. This common, over-the-counter drug can help lower the risk of either a first or a repeat heart attack, in part because of its anti-inflammatory properties, and in part because it is a blood thinner. It can also help keep arteries open in people who have had heart bypass or other artery-opening procedures such as coronary angioplasty. But aspirin is not a cure-all, and because of its risks (including stomach ulcers) the Food and Drug Administration (FDA) has not approved it for preventing heart attacks in healthy individuals.

Interestingly enough, though, it appears that most of the aspirin-type medications referred to as NSAIDs (nonsteroidal anti-inflammatory drugs, such as the over-the-counter medication ibuprofen) do not share aspirin's heart-healthy properties, with the exception of one: naproxen. NSAIDs are therefore not used in the treatment of heart disease.

- Digitalis. This drug is used when the heart's pumping action has been weakened, since it makes the muscles contract harder. It's also used to slow some fast heart rhythms or arrhythmias.

- ACE (angiotensin converting enzyme) inhibitor. This drug stops the production of a chemical that makes blood vessels narrow, and it's used to help control high blood



pressure. It may be prescribed after a heart attack to help the heart pump better or used in individuals with heart failure.

- Beta-blockers. These medications slow the heart and make it beat with less force. As a result, blood pressure drops and the heart doesn't have to work as hard. They're also used for treating high blood pressure and chest pain and for preventing a repeat heart attack.
- Nitrates (such as nitroglycerine). These relax the blood vessels and stop chest pain.
- Diuretics. Sometimes called "water pills," these drugs decrease the amount of fluid in the body and are used to treat high blood pressure.
- Thrombolytic agents (also called "clot busting drugs"). These are given during a heart attack to break up a blood clot in a coronary artery, thereby restoring normal blood flow.
- Anticoagulants (such as Warfarin™, Coumadin™ and heparin). These "blood thinners" are drugs that cause the blood to take longer to clot, thereby preventing buildups and blockages in the heart, veins, or arteries.
- Antibiotics. Though still a novel treatment, some evidence suggests that antibiotics may help people with acute heart attacks and severe angina. Since infections are one cause of inflammation, and inflammation plays an important role in the development of coronary heart disease, eliminating the bacterial source of an infection may improve a patient's condition.
- Tea. Tea contains flavonoids, antioxidants found naturally in various plant foods. Flavonoids are thought to prevent cardiovascular disease. The Determinants of Myocardial Infarction Onset Study, reported in CIRCULATION: JOURNAL OF THE AMERICAN HEART ASSOCIATION, found that moderate tea use was associated with a 28 percent lower death rate for heart attack survivors than for non-tea-drinkers. People who reported heavy tea drinking had a 44 percent lower death rate. This finding held true regardless of age, gender, smoking status, obesity, hypertension, diabetes, or previous heart attack.

It's important that you consult your doctor regarding any medication you take, even over-the-counter ones. Drugs can have side effects – sometimes unexpectedly – and they can interact with each other. Your doctor will be able to tell you which, if any, are right for you.

- Cardiac rehabilitation. Many hospitals that perform heart procedures also have cardiac rehabilitation programs. Patients attend monitored exercise programs and are supervised by trained medical personnel who understand what they are going through. In addition to helping improve physical strength, these programs can also improve a patient's outlook and provide needed support to make important lifestyle changes. The programs usually last 3 to 6 months.

## ***WHAT'S THE PROGNOSIS?***

Heart disease is one of the leading causes of death worldwide, but you can help make sure it doesn't stay that way. Know the factors that put you at risk and take direct, active measures to correct them. Talk to your doctor or other health care professionals about what steps are appropriate for you and resolve to adopt a heart-healthy lifestyle.

And if you should have a heart attack, don't despair – it's never too late for change. Use the experience as an incentive to make the modifications you need to live a healthier,

longer, and ultimately happier life.

## ***ORGANIZATIONAL RESOURCES***

American Heart Association National Center  
7272 Greenville Avenue, Dallas, TX 75231  
Phone: 800.242.8721  
Web site: <http://www.americanheart.org>

NHLBI Information Center  
PO Box 30105, Bethesda, MD 20892-0105  
Phone: 301.592.8573  
Web site: <http://www.nhlbi.nih.gov>

## ***RESOURCES ON THE INTERNET***

(Please note: All links were working at the time of publication. With the ever-changing environment of the Internet, however, some pages may not be accessible at a later time.)

The American Heart Association  
Extensive information on all aspects of heart disease, prevention, and treatment, as well as links to other sites  
<http://www.americanheart.org>

ClinicalTrials.gov, a service of the National Institutes of Health  
Search or browse by condition for "heart" for clinical trials related to heart disease  
<http://clinicaltrials.gov/>

Heart Center Online  
Extensive information about all aspects of heart disease  
<http://www.heartcenteronline.com/myheartdr/home/index.cfm>

Medline Plus  
Click on "Health Topics" and search under "H" for Heart Attack for an extensive collection of articles related to heart attacks and an interactive tutorial  
<http://www.nlm.nih.gov/medlineplus>

The National Heart, Lung, and Blood Institute, the primary research organization for Coronary Disease at the National Institutes of Health  
Click on "Health Information" and follow links to articles on heart for general information, calculator for risk factors, and links to other sites  
<http://www.nhlbi.nih.gov/>

National Institute of Health  
Calculate your Body Mass Index (BMI)  
<http://www.nhlbisupport.com/bmi/bmicalc.htm>

University of Utah Health Sciences Center  
Glossary of cardiovascular diseases.  
<http://www.uuhsc.utah.edu/healthinfo/adult/Cardiac/glossary.htm>

WebMD Health  
Extensive medical information; search by keyword or go to condition center  
<http://www.webmd.com/>

## ***RESOURCES IN THE LIBRARY***

### *Books*

Aldana, Steven G. et al. LIFESTYLE MANAGEMENT FOR PATIENTS WITH CORONARY HEART DISEASE. Dubuque, IA: Kendall/Hunt Publishing Company, August 1999.

Alpert, Joseph S. THE HEART ATTACK HANDBOOK: A COMMONSENSE GUIDE TO TREATMENT, RECOVERY AND STAYING WELL. Boston, MA: Little, Brown & Company, April 1985.

Berra, Kathleen et al. HEART ATTACK: ADVICE FOR PATIENTS BY PATIENTS. New Haven, CT: Yale University Press, January 2001.

Chase, Daniella. THE WHAT TO EAT IF YOU HAVE HEART DISEASE COOKBOOK: SIMPLE, BALANCED, HEART-SMART. Blacklick, OH: McGraw-Hill Trade, August 1998.

Cicala, Roger. THE HEART DISEASE SOURCEBOOK. Los Angeles, CA: Lowell House, August 1997.

Durand, John L. et al. UNDERSTANDING HEART DISEASE: A GUIDE FOR PATIENTS AND THEIR FAMILIES. Wichita Falls, TX: Mockingbird Communications, June 1989.

EIGHT WAYS TO LOWER YOUR RISK OF HEART ATTACK OR STROKE. Broomall, PA: Mason Crest Publishers, 2002.

Ewy, Gordon A. et al. CARDIOVASCULAR DRUGS AND THE MANAGEMENT OF HEART DISEASE. Ann Arbor, MI: Books on Demand, 1992.

Farquhar, John et al. DIAGNOSIS HEART DISEASE: ANSWERS TO YOUR QUESTIONS ABOUT RECOVERY AND LASTING HEALTH. Scranton, PA: W.W. Norton & Company, Incorporated, February 2001.

Helfant, Richard H. THE WOMEN'S GUIDE TO FIGHTING HEART DISEASE: A LEADING CARDIOLOGIST'S BREAKTHROUGH PROGRAM. East Rutherford, NJ: Berkley Publishing Group, December 1994.

Lindsay, Grace M. et al. CORONARY HEART DISEASE: A HANDBOOK FOR THE HEALTH CARE TEAM. Sidcup Kent, UK: Churchill Livingstone, Inc.

Mogadam, Michael. EVERY HEART ATTACK IS PREVENTABLE: THE TWENTY RISK FACTORS. Washington, DC: Regnery Publishing, Inc. (An Eagle Publishing Company), August 2001.

P M Medical Health News Staff. 21<sup>ST</sup> CENTURY COMPLETE MEDICAL GUIDE TO HEART DISEASE, HEART ATTACK, CHOLESTEROL, CORONARY ARTERY DISEASE, BYPASS SURGERY, ANGIOPLASTY. Mount Laurel, NJ: Progressive Management, April 2002.

Purcell, Julia A. et al. HEART ATTACK: BOUNCING BACK. Atlanta, GA: Pritchett & Hull Associates, Inc., February 1997.

Taylor, George Jesse. PRIMARY CARE MANAGEMENT OF HEART DISEASE. Orlando, FL: Mosby, Inc., 2000.

### *Videos*

AFTER THE HEART ATTACK:THE FIRST THREE MONTHS. VHS Video. Evanston, IL: United Learning, 1986.

AFTER THE HEART ATTACK:THE LONGER TERM. VHS Video. Evanston, IL: United Learning, 1986.

HEART DISEASE: PREVENTION AND REHABILITATION. VHS Video. Evanston, IL: United Learning, 1987.

## ***ABOUT THE AUTHOR***

Miriam Ruff is a freelance writer and editor with a degree in Zoology (cell biology) and nearly 30 years' experience writing on a wide variety of topics, including health care, the biological and physical sciences, and education. Her nonfiction work has appeared in scientific journals, newspapers, and books; in addition she has written and produced several audio dramas and short films, and has published three volumes of poetry and a number of short stories. More important to this e-book, though, she has seen the effects of heart disease in family members and friends, reinforcing her belief that prevention is ultimately the best cure.

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