

CARDIO CARE



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SPECIAL YEAR END ISSUE

Heart Attack and Heart Failure

the two most common forms of heart disease

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Heart Attack

Nearly 60,000,000 Americans suffer from some form of heart disease. A heart attack is defined as simply damage to an area of heart muscle due to a sudden and total lack of oxygen supply to a portion of the heart. In a very real sense, that definition doesn't do justice to the experience. The heart has its own blood vessels, called coronary arteries (coronary circulation) that supply the heart with oxygen and nutrients.

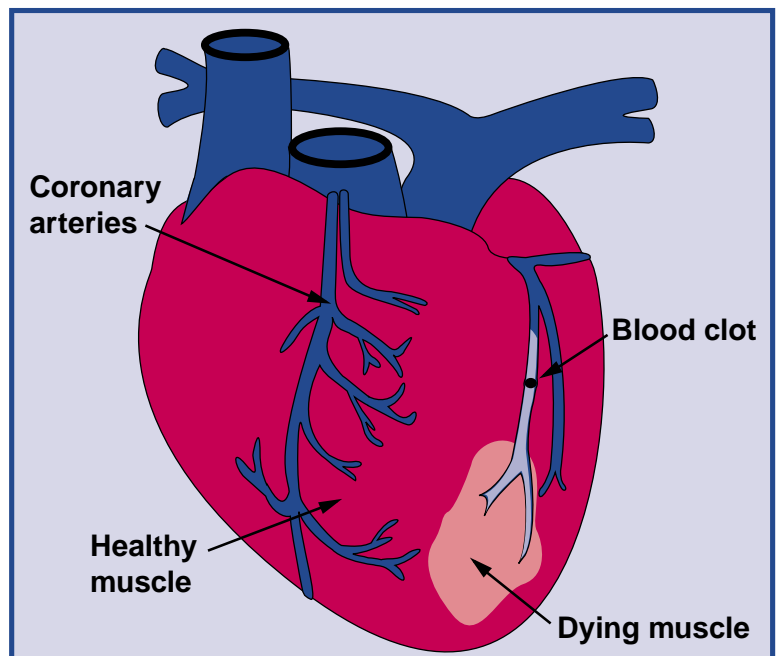
The coronary arteries consist of three major vessels and many smaller vessels. A blockage in one of the arteries will stop the flow of blood to the heart muscle located downstream.

A heart attack, where an area of heart muscle has died, will weaken the heart muscle as a whole so that the heart must work harder each time it contracts to pump blood.

Symptoms of a heart attack

There is no one correct set of symptoms. The "feel" of a heart attack is often described as a squeeze, or a tremendous weight on the chest. A shortness of breath is reported. Most do not feel sharp pain, though discomfort can

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Women and Heart Attacks

Many women are more concerned with cancer than heart disease. They shouldn't be. Heart disease is the number one killer of women in the U.S. Heart disease kills 236,000 women each year, more than all types of cancer combined. Two-thirds of the women who die of a heart attack have no prior symptoms in comparison to only half of men. Even though women under 50 get fewer heart attacks than men of the same age, they are twice as likely to die.

In spite of this evidence, studies show that doctors are less likely to consider heart disease as a possible health problem for women, less likely to take a woman's symptoms seriously, and often treat women patients less aggressively than male patients. If you seek emergency treatment for what you perceive as a heart attack, insist on proper treatment.

Two of the reasons why women are treated differently are: in the past, heart disease was considered a "man's" disease, affecting few women. The second reason is the difference in a woman's description of the symptoms. It should also be noted that women visit family physicians less frequently than men do, so the opportunity to diagnosis heart disease prior to a heart attack is less likely.

As a woman, you may need a special test to diagnose heart disease. Women patients of heart attack or unstable angina, especially younger women, may have normal EKGs. Standard tests can miss heart problems possibly due to the size of arteries, estrogen or other elements in the blood.

- Women who lower their blood cholesterol levels, even by a small amount, reduce their heart-disease risk. Cholesterol ratios are important in gauging women's heart disease risk.
- Monitoring triglycerides is especially important. High levels of triglycerides often go hand in hand with low HDL levels (good cholesterol), a combination that is a greater risk factor for women than men. High triglycerides in women are associated with other risk factors such as a sedentary life-style, obesity, diabetes and high blood pressure.
- Deadly risk factors cluster in women more so than in men. What do we mean by "cluster"? If you look at a list of risk factors, a woman will tend to have more of the risk factors than a man.

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Heart Attack continued

be described as "pain" by some individuals. Symptoms can be prolonged for hours or last only 30 minutes and do not lessen or increase with changes in body position, nor relieved with rest.

Some victims experience a pain that radiates into the arm, with a tingling sensation in the wrist, hand, and fingers. Others report pain in the shoulder, neck, jaw and upper back. For some victims, there simply is no chest pain.

People over 75 years of age and diabetics often do not feel chest pain (silent heart attacks); however, younger persons can also experience silent heart attacks. Acute heart attack is a major cause of sudden death in adults.

What to do if a heart attack occurs

One in three people will die from a heart attack within the first few hours of experiencing chest pain. A quick decision to seek emergency help is the most important factor in surviving and limiting damage. If you are with an individual whose heart has stopped beating, call for emergency help first and then begin CPR immediately (cardiopulmonary resuscitation). If you do not know CPR, contact the closest chapter of the American Red Cross or your local hospital.

The Emergency Department

Routines and procedures in hospital emergency rooms differ and we will not try to illustrate those routines in this article. Rather, we are providing a few specific definitions to

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Heart Failure

Hear failure occurs in approximately 10 out of 100 people and becomes more prevalent with age. It is a condition that affects nearly five million Americans of all ages. Over 400,000 new cases of heart failure will be diagnosed in the next year. Unfortunately, most of these people will not be aware they have heart failure simply because its symptoms, feeling tired and shortness of breath for example, are readily accepted as simply signs of "getting old".

In spite of its name, heart failure does not mean the heart will suddenly stop working. The

disease is gradual. The heart loses its ability to pump blood efficiently, failing to meet the demands of the body. Therefore, the heart must work harder and lifestyle complications are common.

Heart failure can affect the left side, the right side, or the entire heart. Because pumping is inadequate, blood backs up into other areas of the body. In the case of right-sided heart failure, blood can back up into the liver, gastrointestinal tract and other extremities. This is because the right side of the heart receives deoxygenated blood from the body's tissues. In the case of left-side heart failure, blood backs up into the lungs, because the left side of the heart receives oxygenated blood from the lungs that is ready for distribution to the body's tissues. (See Cardio Care Vol. 1 No. 1 March 2000)

Causes of heart failure include: high blood pressure, congenital heart diseases, cardiomyopathy, heart tumor, and heart valve disease. Risk factors include smoking, obesity, excessive alcohol consumption and a diet high in fat, cholesterol, and salt.

Symptoms of Heart Failure

- palpitations (feeling the heart beat)
- irregular or rapid pulse
- unintentional, unexplained weight gain
- swelling of feet and ankles
- swelling of the abdomen
- pronounced neck veins
- loss of appetite, indigestion
- nausea and vomiting
- shortness of breath, especially with physical activity
- shortness of breath after lying down
- difficulty sleeping
- fatigue, weakness, faintness
- decreased alertness or concentration
- cough
- skin discolorations; bluish (cyanosis) or yellow (jaundice)
- decreased urine production
- need to urinate at night

The goal of medical care is to improve the function of the heart. For patients who experience swelling, a diet low in salt and fat will be recommended. In some severe cases,

Division of Cardiac Hemodynamics

H. Fred Downey, Ph.D., directs the Division of Cardiac Hemodynamics. He is Professor of the Department of Integrative Physiology at the University of North Texas Health Science Center. His research interests include control of coronary blood flow and interactions between coronary circulation and cardiac mechanical and metabolic function, especially in conditions that compromise delivery of oxygen to the heart muscle.



Dr. Downey's research is sponsored by the National Heart, Lung, and Blood Institute, the American Heart Association and by private grants. His research has produced over 250 reports in scientific and medical journals. Three patents have resulted from Dr. Downey's research on devices to improve coronary blood flow and circulatory function.

Dr. Downey is a Fellow of the American Heart Association and of the American Physiological Society, and is a member of the International Society for Heart Research, the International Society on Oxygen Transport to Tissue, and the Microcirculatory Society.

The Cardiovascular Research Institute was established in 1995 as an Institute of Discovery of the UNT Health Science Center. It is a multidisciplinary program designed to promote basic and clinical research, education, clinical practice and community outreach programs in the prevention, diagnosis, treatment and rehabilitation of cardiovascular disease of human beings of all ages.

Heart Failure continued

fluid intake may be restricted, or diuretic medications may be prescribed. To reduce the workload of the heart, vasodilator medications may be used. Weight loss may be recommended and patients will be instructed to eliminate smoking and alcohol consumption.

For aggressive treatment, patients may be hospitalized. Medications will be administered intravenously for a faster response. Again, in some severe cases, fluid removal may be required. Circulatory assist devices such as the intra-aortic balloon pump or the left-ventricular assist device may be recommended to stabilize the condition of the patient. In severe cases, a heart transplant may be necessary. ♥

Angina

Pain. A word that defies one precise definition. A word that requires other words in our efforts to communicate: sharp pain, dull pain, radiating pain. What does the pain mean?

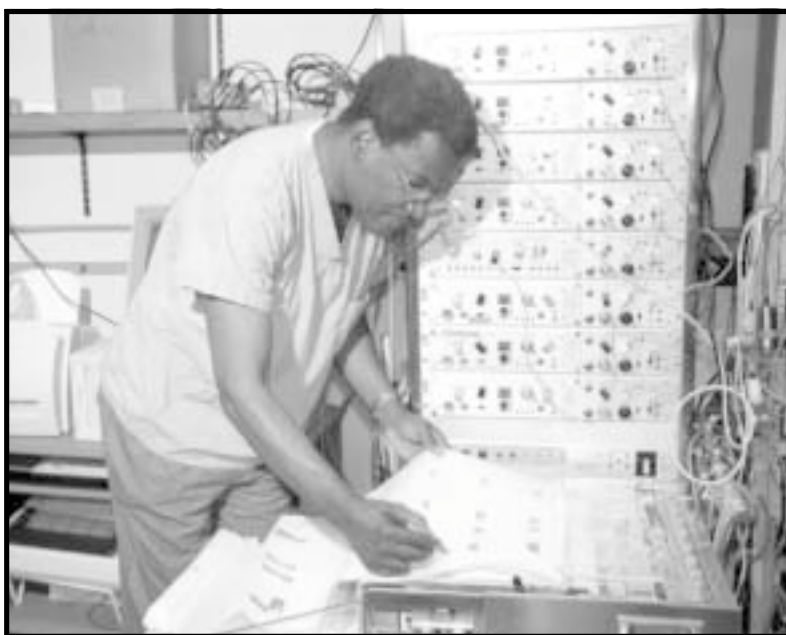
Borrowing the definition from the National Heart, Lung, and Blood Institute (NHLBI): Angina is a recurring pain or discomfort in the chest that happens when some part of the heart does not receive enough blood. It is a common symptom of coronary heart disease, which occurs when vessels that carry blood to the heart become narrowed and blocked due to atherosclerosis.

Angina pain does not indicate a heart attack is about to occur, however, it is an indication of heart disease. Angina pain is normally recognized as a temporary condition, but individuals who experience angina pain are at an increased risk for a heart attack compared to those individuals who have no symptoms of heart disease.

What causes Angina?

Angina can occur when the heart's need for oxygen increases beyond the oxygen available. Physical exertion is the most common cause of angina, however, emotional stress, extreme heat or cold, heavy meals, alcohol, and cigarette smoking are also noted causes.

If you experience what you believe is angina, consult your doctor immediately for a diagnosis. As previously mentioned, the pain of a heart attack is difficult to describe and varies from person to person. If you receive a diagnosis of angina, learn the pattern of your angina. Know what causes an angina attack, what it feels like, the duration of pain, whether medication relieves the attack. If at any time you notice major changes in the pattern of your angina, seek emergency assistance immediately. ♥



Arthur Williams, Senior Research Associate, evaluates test results in the laboratory of the Division of Cardiac Hemodynamics.

- Hormone replacement therapy is safer and more beneficial than doctors tend to realize. Results from the Postmenopausal Estrogen/Progestin Interventions trial sponsored by the U.S. National Institutes of Health (NIH) confirmed that estrogen, either alone or with the hormone progestin substantially lowered the risk of heart disease in women. How? Research from Northwestern University Medical School and the NIH discovered that estrogen controls the growth of tissue in blood vessels, thereby reducing the risk of narrowing. Other research has shown that estrogen makes large coronary arteries dilate, accommodating more blood flow. (It should be noted that in women with a high probability of cancer, hormone replacement therapy may not be advisable.)

The sooner a woman begins preventive measure, the sooner she will reduce her risk of heart attack. ♥

Major Risk Factors in Heart Disease

American Heart Association

- cigarette/tobacco smoke
- high blood cholesterol
- high blood pressure
- physical inactivity
- heredity
- diabetes mellitus
- obesity

some words you may hear in the emergency room or doctor's office. It's important to note that some medications may be prescribed for only the first few weeks or months after a heart attack. If at any time a patient experiences uncomfortable side effects, the doctor should be contacted immediately. Never cease medication without specific instructions from the doctor. Some medications must be gradually reduced to prevent harmful, even fatal complications.

ACE inhibitors: a class of vasodilators given to improve the heart muscle healing process. (Examples: Captopril, enalapril, lisinopril.)

Angioplasty: a surgical procedure, can be performed during the cardiac catheterization. A small balloon is placed at the site of the coronary blockage and blown up with air. This compresses the material causing the blockage to be pressed along the wall of the artery or vein. The procedure can also stretch the vessel to increase blood flow. Sometimes a "stent" is also placed at the site of the blockage to prevent the vein from collapsing.

Anti-arrhythmics: treat abnormal heart rhythms, i.e., Digoxin

Aspirin and Heparin: prevent further blood vessel obstruction.

Blood tests: provide an indication of heart muscle damage. When heart muscle dies, the dead cells release chemicals only found in heart muscle, such as creatinine phosphokinase and troponin T. The amounts of these chemicals in the blood tells the doctor how much heart muscle was damaged and helps identify when the heart attack occurred.

Bypass Surgery: a surgical procedure; as detailed in the Vol. 1 No. 3 issue of Cardio Care (September 2000), coronary artery bypass graft surgery (CABGS) is one option available to the patient of heart disease. CABGS attaches a blood vessel from another part of the body to the injured artery of the heart downstream from the blockage to restore normal blood flow. Normally, the donor tissue is a vein from the leg of the patient. This procedure can be used on more than one blockage during surgery.

Calcium channel blockers and Beta blockers: decrease the heart's need for oxygen and decreases the amount of muscle damage. (Beta-blocker examples: Propranolol, metoprolol, and atenolol.)

News

Cardiovascular Research Institute sponsors volunteers in the AHA Walk-A-Thon

The Cardiovascular Research Institute helped sponsor the walking teams from the UNT Health Science Center at the annual American Heart Association Walk-A-Thon in Fort Worth on October 7th. Though the weather was less than cooperative – raining, temperature in the low 40s with a wind chill of freezing, the Fort Worth Chapter of the American Heart Association raised \$200,000 for cardiovascular disease research. The Cardiovascular Research Institute, partnered with the UNT Health Science Center contributed \$7,300.00 in financial support and donations.

Peter B. Raven, Ph.D., Director of the Cardiovascular Research Institute (CRI) is vice president of the Fort Worth Chapter of the American Heart Association. A. H. O-Yurvati, D.O., Director of Clinical Research of the CRI and a practicing cardiac surgeon in Fort Worth, is the current chapter president. Many thanks to all who volunteered for a great cause. ♥



Wendy Wasmund, CRI Research Associate, & Steve Wasmund, Graduate Teaching Assistant, manage a water station table for the walkers along the 10k route.



from l to r: Peter Raven, Janelle Hardisy, Wendy Wasmund, Steve Wasmund, Keiko Ogoh, & Shigehiko Ogoh preparing for the walk-a-thon.

Did you know...

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Cardiac Catheterization: this is a simple procedure. A very thin catheter is inserted through a vein or artery in the arm or leg and fed into the coronary arteries of the heart. The purpose of this procedure is to allow the doctor to measure oxygen, blood pressure, and other functions of the heart. Dye can be injected to identify obstructions.

Digitalis: improves the pumping action of the heart.

Electrocardiogram (EKG): records the bioelectrical rhythm of your heart. Wires are attached to the chest, arms and legs using pads. Alterations in the heart's rhythm, as recorded by the EKG, will alert the emergency room personnel that another heart attack is occurring.

Thrombolytic: medication given to dissolve blood clots; usually given within 30 minutes of arrival in the emergency room.

Vasodilators: opens the blood vessel by relaxing the muscular wall of the vessel and prevents blood vessel spasm, i.e., Nitroglycerin

Warfarin or Coumadin: commonly used blood thinners. ♥

Heart Rhythm:

Ever hear the words ventricular fibrillation or sinus rhythm?

In order for the heart to pump, the four chambers must contract in an organized rhythm. A small bundle of specialized cells located in the right atrium - the sinoatrial node (SA node), also called the "sinus node", sends a bioelectrical impulse across a chamber of the heart causing it to contract. The SA node generates electrical impulses at a specific rate (normal sinus rhythm), but discharge can also vary based on emotional and hormonal factors. When a portion of the heart muscle no longer functions, such as the damage caused by a heart attack, it may cause an electrical instability, or ventricular fibrillation (VF). The heart simply quivers and is incapable of pumping oxygen to the body, particularly the brain. Permanent brain damage and death can occur if oxygen is not restored within four to six minutes. ♥

The Truth About Aspirin

Aspirin does help to prevent the occurrence of a second heart attack. It can even help prevent a first heart attack. However, it must be pointed out that aspirin is not a cure for heart disease, nor can it reverse the damage of a previous heart attack.

Many people take an aspirin daily without knowing exactly how the aspirin is helping their health. Quite simply, the aspirin helps to prevent platelets from forming blood clots. Platelets are a component of blood whose main function is to clot blood. By preventing this clotting action, the aspirin helps to prevent a build-up of bio-material deposits that will eventually clog the arteries.

If aspirin has not been prescribed, you should discuss with your doctor the benefits and complications of aspirin before you begin adding it to your regular routine. Aspirin is not right for everyone. Frequent use of aspirin can cause stomach irritation and in an extreme form, hearing loss. Others can be allergic to aspirin in more tragic ways. Aspirin should be avoided if you have high blood pressure, a family history of stroke, a bleeding disorder, ulcers, liver or kidney problems or if you are already taking a blood thinning drug such as warfarin or Coumadin.

The best weapon you will ever have in the fight against heart disease is to reduce your vulnerability to the disease by reducing your risk factors. ♥

CARDIO CARE is a publication of the Cardiovascular Research Institute at the University of North Texas Health Science Center at Fort Worth. Information contained in this publication is educational only and is not intended to replace proper medical evaluation. If you have specific medical questions concerning your personal health, please contact your family physician.

CRI Faculty

James L. Caffrey, Ph.D.
Associate Director of the CRI
Division of Cardiac Endocrinology

S. Dan Dimitrijevic, Ph.D.
Division of Cell & Tissue Engineering

H. Fred Downey, Ph.D.
Division of Cardiac Hemodynamics

Stephen Grant, Ph.D.
Division of Molecular and Vascular Genetics

Robert T. Mallet, Ph.D.
Division of Cardiac Metabolism

Michael L. Smith, Ph.D.
Center for Sleep Research

Associate Faculty

Neeraj Agarwal, Ph.D.
Mark Baker, D.O.,
Barbara A. Barron, Ph.D.
Joan F. Carroll, Ph.D.
Patricia A. Gwartz, Ph.D.
Andras Lacko, Ph.D.
A. H. O-Yurvati, D.O.
Xiangrong Shi, Ph.D.
Craig W. Spellman, D.O., Ph.D.
Scott Stoll, D.O., Ph.D.
Donald E. Watenpugh, Ph.D.
Martin Weiss, D.O.
Thomas Yorio, Ph.D.



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CARDIOVASCULAR RESEARCH INSTITUTE
3500 Camp Bowie Boulevard
Fort Worth, Texas 76107-2699

cri.hsc.unt.edu