

# SARVER HEART CENTER

A publication from The University of Arizona College of Medicine Newsletter Issue 47 • Winter 2006/07

## Cover story

End-stage heart failure is just the tip of the iceberg. Tom and Sabina Sullivan take on a problem that goes deeper.

**3**  
Heart News For You:  
When the heart fails

**4**  
Uncontrolled hypertension:  
The silent killer



Normal artery (left) and narrowed artery due to hypertension

**6**  
Award-winning research at the Sarver Heart Center



## The Tom and Sabina Sullivan, Sr. Endowed Chair for the Prevention and Treatment of Heart Failure

*A Milestone in the Fight Against Heart Failure*

**T**hrough a generous gift, Tucson businessman Tom Sullivan, Sr. and his wife, Sabina, have created an endowed chair with a special focus on the prevention and treatment of heart failure at The University of Arizona Sarver Heart Center.



*"We are impressed by the successful history and the promise of future accomplishments of the Sarver Heart Center." – Sabina and Tom Sullivan, Sr.*

Heart failure affects all ages and comes in a variety of stages (*see page 3*). "Like the tip of an iceberg, patients with end-stage heart failure stand out because they need dramatic therapies to ensure their survival, such as a

transplant, an assist device or a Total Artificial Heart," says Gordon A. Ewy, MD, director of the UA Sarver Heart Center. "But there is a much larger number of people who have no, or mild, symptoms but are bound for end-stage heart failure if untreated."

The Cardiothoracic Surgery team of the Sarver Heart Center is among the best in the world. Led by Jack G. Copeland, MD, the team has performed 773 heart transplants and 54 heart-lung transplants. "We are very good at taking care of those suffering from end-stage heart failure," says Dr. Copeland. "We need to make advances, not only to help bring people back from the brink of end-stage heart failure, but also to recognize and aggressively treat the early stages. The Tom and Sabina Sullivan, Sr. Endowed Chair for the Prevention and Treatment of Heart Failure fills a crucial gap."

Asked about the motivation for the gift, Tom says: "My father passed away because of heart failure. Sabina and I really decided to make our gift after spending time visiting the Sarver Heart Center. We are impressed by the persistence with which its members have pursued their goal – a future free of heart disease and stroke. The center's successful history and the promise of future accomplishments were very important factors in our decision as well."

"The Sullivan's gift is very special to me as it endorses Tom's and Sabina's friendship


*continued on page 2*

## ...from the Director

**H**ow can we succeed with failure? There are many types of failure, but heart failure is one that even the most suc-



cessful of people can and do develop. With medical advances increasing longevity, the number of people suffering from heart failure is rising. Heart failure is a progressive disease that involves a series of stages (see page 3). Those at the bottom of the pyramid have a good chance of not progressing to the top – end-stage heart failure – if treated appropriately for their cardiovascular risk factors. Those with symptomatic heart failure – the most common cause of hospitalization in the Medicare age group – require special attention and improved therapies to assure a better life. Patients with end-stage heart failure form the top of the pyramid. At the Sarver Heart Center, these patients are under the care of Dr. Jack Copeland and his team – world leaders in heart transplantation and artificial heart technology. The newly established Tom and Sabina Sullivan, Sr. Endowed Chair for the Prevention and Treatment of Heart Failure will help patients at all levels of the pyramid, including those with structural heart disease, with or without symptoms. If identified early and treated appropriately, there can be success and many of these patients can be prevented from entering the symptomatic phase of heart failure.

  
GORDON A. EWY, MD  
Director, UA Sarver Heart Center

## Endowed Chair *continued from page 1*

by supporting a cause of which I am a very strong supporter,” says Humberto Lopez, chairman of the Sarver Heart Center Advisory Board and president of HSL Properties, Inc. “This endowed chair gets us closer to a future free of heart disease.”

Tom is chairman of the board of First Magnus Financial Corporation, ranked as one of the nation’s top private mortgage banks. First Magnus Financial Corporation just completed its tenth year in business.

“Our success has come because from the beginning we have hired the most talented personnel,” Tom says. “We see similarities in the physicians and scientists of the Sarver Heart Center. Our gift also is based in part on the contributions that the Sarver Heart Center has made to society, and we want to help assure that the Center’s future discoveries will benefit the greatest number of people.”

After completing his undergraduate degree at the University of North Dakota and serving in the Strategic Air Command, Tom lived in Boulder, Colo. He completed his law degree at the University of Colorado and practiced in Boulder for several years. In Tucson he started Title Security in 1972, a company that was locally owned and operated, and soon would flourish and expand statewide. It was during that time that Tom met his wife, Sabina, a CPA. “She was actually auditing one of my competitors, we later discovered,” says Tom. Sabina recalls, “We met at a party and Tom asked me out. A week or so later we had our first date, and soon we married. We truly enjoy each other’s company.” Having just celebrated a milestone anniversary, Sabina and Tom now split their time between Tucson and Hawaii and are virtually inseparable.

“We are grateful to Tom and Sabina for their commitment – their gift will have a truly transformational effect on our ability to treat, diagnose and prevent heart failure,” says Dr. Ewy. “Their insight and generosity will allow the Sarver Heart Center to attack head-on the present emerging epidemic of heart failure.” ♥

The UA Sarver Heart Center Newsletter is published regularly. News reporters are welcome to quote from newsletter articles and are kindly asked to provide credit. Correspondence or inquiries should be addressed to: UA Sarver Heart Center, Public Affairs, PO Box 245046, Tucson, AZ, 85724-5046. All contents © 2006 Arizona Board of Regents. The University of Arizona is an EEO/AA - M/W/D/V Employer. Please visit the UA Sarver Heart Center online: [www.heart.arizona.edu](http://www.heart.arizona.edu)

**UA Sarver Heart Center Director** Gordon A. Ewy, MD  
**Co-Directors** Jack G. Copeland, MD  
Eugene Morkin, MD

**Director of Development** Clint McCall (520) 626-4146 or (800) 665-2328  
**Director of Communications** Daniel Stolte (520) 626-4083, [stolte@email.arizona.edu](mailto:stolte@email.arizona.edu)  
**Additional Writing** Clint McCall  
**Design / Production** AHSC Biomedical Communications

## ‘F’ is for Failure - Heart Failure

BY GORDON A. EWY, MD

*With this issue, we resume our “Heart News for You” series. If you missed any of the earlier issues, A for Antiplatelet Therapy, B for Blood Pressure, C for Cholesterol, D for Diet, D for Diabetes and E for Exercise, we invite you to read them on our web site at [www.heart.arizona.edu](http://www.heart.arizona.edu).*

About 5 million people in the United States have heart failure, and the number is growing. Each year, another 550,000 people are diagnosed with the condition. Heart failure contributes to or causes about 300,000 deaths each year.

Heart failure does not mean that the heart has stopped or is about to stop working. It means that it cannot pump out enough blood to keep up with the body’s demands for energy and oxygen. Heart failure can result from genetic predisposition or from injury, such as a heart attack, too much strain on the heart due to years of untreated high blood pressure or a diseased heart valve.

As the heart muscle weakens, it needs to pump faster to keep blood flowing to the body. In many cases of heart failure the left ventricle has trouble ejecting the blood properly into the body’s circulation. As a result, blood tends to pool and back-up in the pulmonary (lung) circulation, causing fluid to leak into the lungs, a condition called pulmonary edema. This is what the patient experiences as shortness of breath.

Heart failure comes in stages, as illustrated by the “Heart Failure Pyramid” (right). The pyramid shows that while patients with severe, end-stage heart failure are at the tip, the number of people afflicted with heart disease becomes ever larger the further you go toward the bottom.

Stage A includes those conditions that predispose to structural heart disease, which can lead to heart failure. This stage emphasizes the fact that heart failure usually can be prevented by controlling its risk factors.

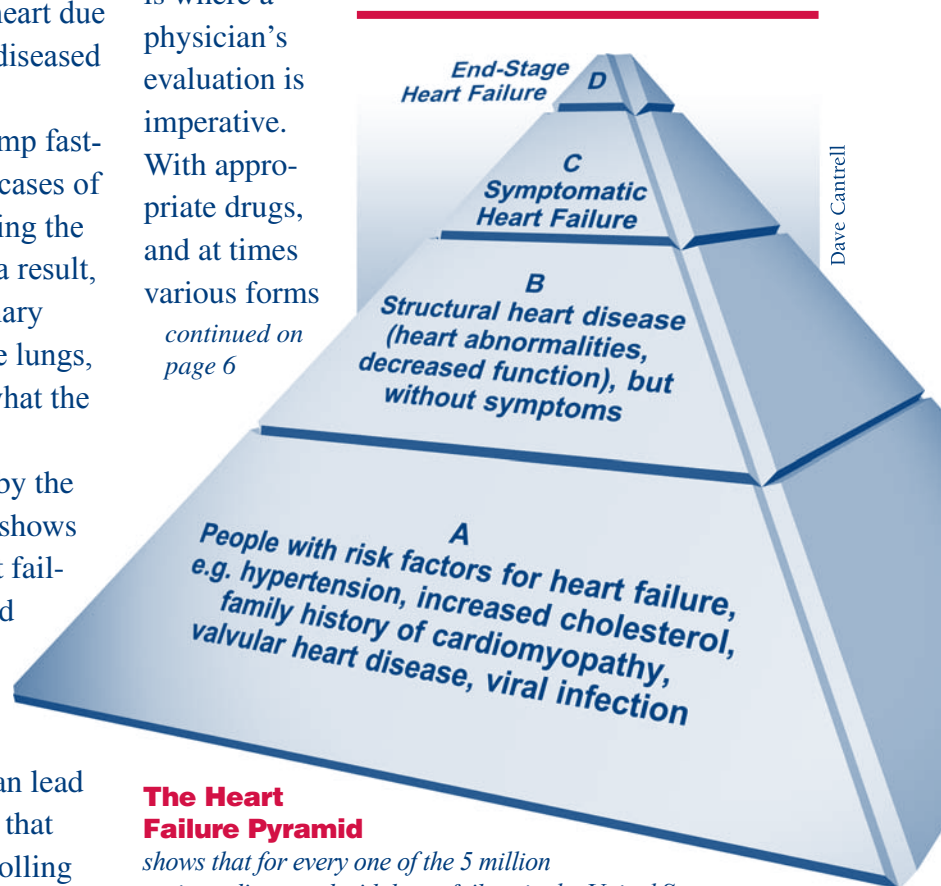
Stage B includes those individuals affected by struc-

tural heart disease, such as an enlarged heart, leaking or blocked heart valves, a previous heart attack, inherited abnormalities or infectious damage of the heart muscle. All of these are significant problems, but not compromising the heart’s pumping ability enough to cause symptoms yet.

Stage C, symptomatic heart failure, includes patients with enough heart dysfunction to result in symptoms. Symptoms are caused by a decreased forward blood flow to the body, characterized predominantly by weakness and/or fatigue, or by the backing up of fluid in the lungs, causing shortness of breath, and/or backing up of fluid in the body causing congestion of the liver and/or swelling of the legs – usually beginning with ankle “edema” or swelling. Obviously many causes of weakness, fatigue, shortness of breath and ankle swelling are not due to heart failure, and this is where a physician’s evaluation is imperative.

With appropriate drugs, and at times various forms

*continued on page 6*



### **The Heart Failure Pyramid**

*shows that for every one of the 5 million patients diagnosed with heart failure in the United States, there are several who do not experience any symptoms but are at risk of developing the disease later in life.*

---

# Unmasking the Silent Killer

## *Malignant hypertension: Why it is important to keep a keen eye on blood pressure*

“I have the cholesterol of a teenager, I’m not overweight, I exercise, watch what I eat.” This is how Norma Slone describes herself. “Of course, I am stressed sometimes, but I thrive on it.” Like many women with a healthy lifestyle, she did not give blood pressure a second thought until the day she found out that, for her, vascular disease was a looming reality.

Connie Whitehead, on the other hand, spent much of her life dreading the impending doom – malignant hypertension. “In my family, turning 50 is a curse,” Connie says. “My grandfather spent his last years confined to a rocking chair so as not to raise his dangerously high blood pressure even more. My mother endured a hundred strokes before she finally passed away.”

High blood pressure has been called the silent killer for a very good reason. “There are no real symptoms; you don’t feel bad when your blood pressure is too high,” explains Sarver Heart Center member and internist Lori Mackstaller, MD. “You simply don’t think about it.” Prolonged high blood pressure damages the arterial system – the blood vessels carrying blood from the heart to the lungs and the rest of the body – resulting in increased risk of stroke, heart attack, heart failure and kidney failure, to name a few.

According to the latest report of the Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure, the ideal blood pressure is 115/75 mm-Hg (millimeters of mercury). The risk from hypertension doubles for every 20 mm-Hg increase in the systolic (larger number) and for every 10 mm-Hg increase in the diastolic (smaller number) blood pressure. As an example, if your blood pressure is 155/95 mm-Hg, your risk is four times that of someone with an ideal blood pressure of 115/75 mm-Hg.



Norma Slone

www.christmooney.com

High blood pressure is one of the major risk factors for arterial disease, in addition to age, genetic predisposition, unhealthy cholesterol levels and smoking. Because arteries supply blood to every organ of the body, arterial damage from hypertension can lead to multiple organ damage.

**“I had no idea...none,”** Norma Slone says. “My primary care doctor had just retired from practice, and I was seeing a new doctor who told me my blood pressure numbers were high.” Like so many of us, those numbers did not really sink in with Norma that day. “Then, one day I decided to make an appointment with my husband Jim’s cardiologist at the Sarver Heart Center. I felt almost guilty going in, as I thought there was nothing wrong with me; I just wanted some information about two minor conditions I knew I had.”

Norma left that day with the diagnosis of a high blood pressure and instructions to buy a blood pressure home measuring device and take two solid weeks of measurements. “The machine had to be put together,” Norma recalls, “but I was busy with other things and got distracted.” The unopened box gathered dust.

Then one day my husband brought home a *TIME* magazine article on high blood pressure acting as a silent killer. “I remember reading that article, seeing those pictures of arteries that have plaque,” says Norma. “That’s when I heard the wake-up call.”

After additional follow-up with Dr. Ewy and finding the right medications, Norma is now managing her blood pressure. “He is a doctor and gentleman of the old school, and I am privileged to be in his care,” Norma says. “I may forget many things in my day, but the one I never forget is my blood pressure medicine.” She has come to understand the damage caused by out-of-control blood pressure. “I just want to feel as good as I can for as long as I can.”

### **Malignant hypertension**

In January 2006, Connie Whitehead was having trouble with her vision so she made an appointment with her ophthalmologist, Kathryn Henry, MD. During her eye exam



Connie Whitehead  
with her husband, Paul

Connie expected her doctor to tell her it was time for a new prescription for glasses. Instead, she received news she thought was devastating at the time. “I remember hearing, ‘The problem is not your eyes but your blood pressure.’ I was already taking medication for hypertension, so it felt like I was going from a normal life

with a managed condition to a walking stroke,” Connie says. Malignant or severely out-of-control hypertension is usually defined as very high blood pressure with swelling of the optic nerve behind the eye, called papilledema, thus causing vision impairments.

Knowing the danger of high blood pressure, Connie called her primary care physician immediately. He told her to double her medication and to see him within two weeks. No results. “I had never seen Connie’s spirit broken,” says Connie’s husband, Paul Capp, MD, the retired founding chief of radiology at University Medical Center. But by early March, each day she asked herself, “Is this the day I am going to be driving when I have a stroke and kill someone?”

Malignant hypertension affects about 1 percent of people with elevated blood pressure. In some patients, malignant hypertension is secondary to potentially curable causes, such as glands that put out too much adrenalin or steroids. But most patients have a familial or inherited form of hypertension that, if uncontrolled, can become malignant.

Malignant hypertension is a medical emergency if left untreated, causing strokes, heart attacks, kidney failure and damage to multiple other organs. Many body systems are at serious risk due to the extreme elevation of blood pressure. Multiple organs of the body,

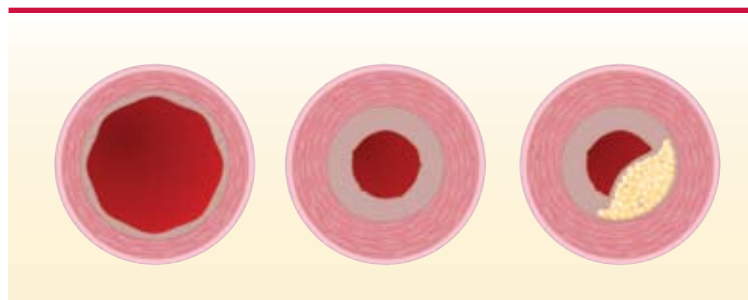
including the brain, eyes, blood vessels, heart and kidneys may sustain damage. The kidneys are highly susceptible to damage caused by high blood pressure, and kidney failure results in the need for kidney dialysis or transplant.

“After about six months of not being able to get my blood pressure under control in spite of several medication changes, Paul was kind enough to get me an appointment with the Sarver Heart Center and Dr. Ewy,” says Connie.

Feeling defeated by her disease, she had little expectation that her condition could be improved. Dr. Ewy assured Connie that they could get her pressure under control, but it might take some time and experimentation with different doses and combinations of several medications. Within two months and several different prescriptions later, Connie had her blood pressure in check and her life back. “We have 16 grandchildren; I now know I will be with them for a very long time.”

**In all cases, high blood pressure** is a condition that needs to be addressed without delay.

“Your physician can help you manage high blood pressure through proper medications along with a diet and an exercise program,” says Dr. Mackstaller.



*Under pressure: Hypertension causes the inner layers of arteries to thicken at the expense of the lumen, restricting blood flow and increasing blood pressure even further (left: cross section of normal artery; middle: damaged artery with restricted lumen). If arteries are damaged both from hypertension and atherosclerotic plaques (right), the risks from both conditions amplify each other.*

Dave Cantrell

“For mild increases in blood pressure, lifestyle changes like decreased salt intake and weight loss may be all that is needed.” “However, since there are many causes for high blood pressure, different medications with different mechanisms of action often are needed. In fact, the average number

of prescription medications is three!” But what about blood pressure that gets too low? Dr. Mackstaller laughs. “I am often asked: ‘How low a blood pressure is too low?’ Well, as long as you can stand up without fainting and think clearly you’re fine.” ♥

---

## F is for Failure

*continued from page 3*

of pacemaker therapy, heart function in stage C patients can be dramatically improved.

Stage D is called “end-stage heart failure.” Patients who have reached this stage may require more dramatic measures, such as cardiac transplantation at one end of the spectrum and palliative care on the other. Although dramatic, end-stage heart failure is just the tip of the pyramid – a constant reminder of the imperative to identify individuals in stages A, B and C and initiate therapy to prevent the progression of the disease. As someone once said, “An ounce of prevention is worth a pound of cure.”

Heart failure is an increasingly common medical condition in both men and women. Although it can occur at any age, a major risk factor is age. This is emphasized by the statistic that heart failure increases with age and is now the most common Medicare hospital discharge diagnosis.

There are two general types of heart failure, “systolic” and “diastolic.” Systole refers to the period of time when the heart contracts, and diastole to the period when the heart relaxes – diastole is Greek and means “drawing apart.” The heart muscles are drawing apart as they relax after contraction.

In “systolic heart failure,” the heart muscle is weak and does not contract well, so the heart does not pump normally. With “diastolic

heart failure,” the heart muscle contracts normally but does not relax normally. As a consequence, it takes higher pressure to fill the heart, resulting in fluid backup in the tissues, for example the lungs and/or the legs. Therefore, common symptoms of both systolic and diastolic heart failure are shortness of breath and swelling of the ankles. Decreased forward blood flow is another hallmark of heart failure, leading to fatigue.

Systolic heart failure may occur after a heart attack (myocardial infarction), in which part of the heart muscle is damaged by a blocked coronary artery and becomes a scar. Since a scar does not contract, this weakens the heart. Individuals with very small scars may not ever have

a problem, but most individuals with heart damage will undergo changes, referred to as “remodeling,” in which the heart enlarges to compensate for the defect, losing its ability to contract normally.

Although therapeutic advances over the past three decades have helped our understanding dramatically and have improved our approach to treatment of heart failure, there is much to learn. By their continued focus on the microstructures, cellular and intact myocardial function, by drug testing and continued investigation of electrical therapies, Sarver Heart Center members are continuing to prevent, cure, or improve the quality of life for the increasing number of patients with heart failure. ♥

---

## *Lot of* With a Little Help From Our Friends: Fighting Heart Disease through Innovative Research

The success of the Sarver Heart Center rests on the three pillars of academic medicine – patient care, education and research. Thanks to the ongoing support from our donors, the Center is able to award more than \$100,000 each year to innovative research projects. Following are the awards and this year’s recipients, many of them excellent young scientists, highly motivated and poised for significant discoveries.

### *Steven M. Gootter Investigator Award for the Prevention of Sudden Cardiac Death*

Established by Joe and Paulette Gootter and the Steven M. Gootter Foundation, in memory of Steven, whose life was cut short tragically by sudden cardiac arrest.

**First Recipient:** Richard D. Lane, MD, PhD, professor of psychiatry, psychology and neuroscience at the UA

**Project:** Neurophysiologic trigger of heart rhythm disturbance in the context of emotional stress and coronary artery disease.



*From bench to bedside: In the UA's new Medical Research Building, scientists of the Molecular Cardiovascular Research Program will pave the way for new therapies based on a better understanding of the molecular mechanisms underlying heart disease.*

**Second Recipient:** Vincent L. Sorrell, MD, associate professor of clinical medicine and radiology and holder of the Allan C. Hudson and Helen Lovaas Endowed Chair of Cardiovascular Imaging

**Project:** Predictability of sudden cardiac death by cardiac magnetic resonance imaging (MRI); initiation of a prospective registry of patients receiving implantable cardiac defibrillators.

**Third Recipient:** Anke Ziesenis, PhD, research associate in the laboratory of Carol Gregorio, PhD, who leads the Molecular Cardiovascular Research Program

**Project:** Role of the protein actin in heart failure. Actin is the major component of muscles – including the heart muscle. Changes in actin caused by genetic mutations play a role in sudden cardiac death.

### ***Bettie F. Pitts Memorial Heart Disease Research Award***

This award is given to a team of researchers working on projects with great promise in helping the UA Sarver Heart Center accomplish its mission of a future free of heart disease and stroke. The award is made in gratitude and in celebration of our dear friend from Green Valley, long-time board member, volunteer and supporter, Bettie Pitts.

**Recipient:** Leslie Ritter, PhD, Sarver Heart Center faculty member

**Project:** Diabetes as an independent risk factor for ischemic stroke. The results may aid in predicting which diabetic patients are at a higher risk of worse outcomes after a stroke.

### ***Sandra B. Katz, MD, JD, & Diane Stephenson Research Award***

This award is made possible through the generosity of Sandra Katz, retired ophthalmologist and attorney, and Diane Stephenson, long-time teammates in the sport of fencing and the practice of medicine.

**Recipient:** Elizabeth Juneman, MD, senior cardiology fellow at the Sarver Heart Center

**Project:** Magnetic resonance imaging in Trastuzumab (commonly known as Herceptin®) – associated cardiotoxicity in patients with breast cancer characterized by an overproduction of the HER2 cell receptor. Screening and careful monitoring of patients is important as medications used to treat this type of cancer can cause serious heart problems.

### ***William J. “Billy” Gieszl Endowment for Heart Research***

Established by the Gieszl family in memory of their son and brother, the endowment provides support for basic and clinical scientific investigations of merit to achieve improved diagnosis, treatment and prevention of congenital heart disease.

**Recipient:** Brent Barber, MD, pediatric cardiologist

**Project:** Diagnosis of early cardiac dysfunction in patients with Duchenne Muscular Dystrophy (DMD), one of a group of muscular dystrophies that affects mostly males and is characterized by the enlargement of muscles and a rapid progression of muscle degeneration that occurs early in life. Dr. Barber's research will use Doppler echocardiography and cardiac MRI to identify problems in the heart muscle at an earlier stage.

### ***The Philip and Bobbie Hanft Young Investigator Award***

Made possible through a generous endowment established by the late Philip M. Hanft and his wife, Bobbie.

**Recipient:** Brad Davidson, PhD

**Project:** Roles of fibroblast growth factor proteins in early heart development. Goal: Identify genes that regulate the response of potential heart cells to the growth factors.

### ***The Mark and Emma Schiffman Endowment***

Established at the UA Foundation in 1997 from the estate of the late Emma A. Schiffman of Phoenix.

**Recipient:** Diana Darnell, PhD

**Project:** Role of microRNA molecules and their function in vascular development. ♥

---

## Dr. Copeland Honored by Mended Hearts Association



**J**ack G. Copeland, MD, co-director of the UA Sarver Heart Center and holder of the Jack Copeland

Endowed Chair of Cardiothoracic Surgery, has been awarded the Dwight Emary Harken Award for his outstanding contributions to the field of cardiothoracic surgery.

“Receiving the Harken Award at the Mended Hearts’ Phoenix convention was a great honor,” says Dr. Copeland. “To be included

among such an outstanding group of previous recipients made me proud, and to be among the members at the convention and see them ‘in action’ was an inspiration.” The award, named in honor of the founder of Mended Hearts, pioneer heart surgeon and renowned cardiologist Dwight Harken, MD, is given every two years to an individual or an organization who

has demonstrated excellence in the field of cardiovascular medicine. In addition to performing the first heart transplant in Arizona, Dr. Copeland was the first to use an artificial heart as a bridge to transplant and the first in the United States to use a Berlin Heart assist device. In 2001, Dr. Copeland received the Barney Clark Award for advancement of artificial heart technology. ♥

*Contributor: Jon Caswell*

### Save the date!

February 10, 2007

University Medical Center, Tucson

### Healthy Heart Public Education Conference 2007

Learn what you need to know to prevent heart disease and stroke. This popular annual public education experience will include a focus on cardiovascular health for women. To pre-register, please email [stolte@u.arizona.edu](mailto:stolte@u.arizona.edu) or call (520) 626-4083.



*Brandi Dycus (middle left) and Sherry Gustafson, both of UMC’s diagnostic cardiology, receive the 1<sup>st</sup> Annual Brian Bateman Superb Service Award from Brian Bateman (left), former director of development for the UA Sarver Heart Center and now senior director of development for the UA College of Medicine, and Gordon A. Ewy, MD, director of the UA Sarver Heart Center. The award was created to honor staff members who go above and beyond the call of duty for patients and friends of the Sarver Heart Center.*



Sarver Heart Center

The University of Arizona  
Sarver Heart Center  
PO Box 245046  
Tucson, AZ 85724-5046

ADDRESS SERVICE REQUESTED

---

**NON-PROFIT ORG.**  
U. S. POSTAGE  
PAID  
TUCSON, ARIZONA  
PERMIT NO. 190

---