

S A R V E R  
**H E A R T**  
C E N T E R

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Issue 35

# Should We Pay for Donor Organs?

By Jack G. Copeland, MD

*Does this idea  
cheapen  
transplantation  
by putting a  
“price” on the  
donor organ? ...  
Just ask a  
transplant  
recipient if he  
or she could put  
a price on a  
new heart.*

*In Issue 34, Dr. Copeland addressed the shortage of donor organs in Arizona. Here, he discusses a possible solution.*

Over the last 20 years, a variety of approaches have been undertaken to improve the numbers of donated organs in this country. We’ve tried television and radio advertising, educational programs and driver’s license declarations.

But they’re not working.

In the year 2000, about 2,200 people received heart transplants. But about 5,000 more people who needed them didn’t get them.

At the UA Sarver Heart Center, we have repeatedly been in the top 20 centers for number of heart transplants, averaging 33 per year over the past 10 years. But, over the last three years, we have dropped to 27. And we have a list of about 50 patients waiting for transplants. Each year, we lose 10 of these people to advanced heart failure.

These patients are “high risk” and many need artificial heart support until a donor heart is found. In the past 10 years, the percentage of high-risk patients placed on devices while they wait for hearts has gone from 7 percent to 51 percent, adding to the urgent need for more donor hearts since device support is costly for the hospital and for society. It also is a strain on the patients and their families.



As you probably are aware, Arizona is among the lowest 10 percent of states for heart donors per 1 million people. As there is good reason to believe that our number of brain deaths is similar to states that have twice as many heart donors, we have to wonder: “How do we increase the numbers of donors in the state?”

I believe it’s time to take a more vigorous approach. Congress is now considering three financial incentives to increase donations – providing payment of the burial expenses of donors, granting a one-time tax credit (\$10,000) or giving a tax rebate (\$2,500) to donor families. These are positive and relatively inexpensive ways that the government could encourage organ donation. In addition to the emotional benefit that comes from donating organs, the grieving families would be relieved of some of the financial burden they’ll face.

Continued on page 2

## Donor Organs

Knowing of these incentives might encourage the family, at the time of brain death of their loved one, to think of donation and ask for information. A simple query from the family would break the fear of litigation that exists in some hospitals and among some doctors and nurses. It would facilitate communication and help hospital personnel enter into a discussion about the donation process.

It's important to note that organ donation is not discussed while a patient is being treated for life-threatening conditions. Only when it becomes clear that there is irreversible and fatal brain damage to the victim are any considerations

made regarding organ donation. Up until that time, every order, every medication, every intervention is made for the victim.

Declaration of brain death is a clinical diagnosis that is made by a specialist in the neurosciences. It is reliable and has been used for over 30 years. It represents a synthesis of the history of the accident and findings on examination of the patient that even the most primitive functions such as central reflexes and the drive to breathe are gone and that there is no hope that they will return. Once this declaration or pronouncement is made, there are two options: 1. Speak with the family and withdraw support and 2. Speak with the family, suggest organ donation and ask a coordinator from the Donor Network of Arizona to speak with the family. These coordinators have special training in grief counseling and are also highly qualified to discuss the benefits of transplantation not only for the organ recipient but also for the donor family.

At this point, the family is facing the loss of a loved one and undergoing an expected grieving process. Sadness is often profound and needs to be recognized and expressed. Anger often follows. Rational thought and ability to

receive information may be limited temporarily. Support, willingness to listen, patience and clear communication from nurses and doctors in the emergency room or intensive care unit are vital aspects of the care for the family.

Under current laws, there is no payment to the donor family. The cost of care of the donor from the time of brain death until organ procurement is borne by the recipients of the organs. There is no identification of the recipients; likewise, the recipients are not given the

***By financially supporting the donor effort, it is entirely possible that we could double the number of donors in Arizona.***

identities of the donor family members.

When this process works, it is a testimony to human kindness. Unfortunately, especially in Arizona, it doesn't work very often. Why?

Some of the blame appears to fall on the hospitals. By law, they are required to report potential donors or risk losing all Medicare funding. But records over the past 10 years show that there are large discrepancies in donor numbers, particularly among the trauma centers. This indicates that either the law is not being enforced or that it is not enforceable.

Perhaps the families could help close the gap if they knew their generosity would be rewarded in very small part with a financial incentive. If families took the initiative, doctors and nurses would be relieved of the burden of bringing up such a sensitive topic.

The question some will ask is whether payment for organ donation is ethical. Does this idea cheapen transplantation by putting a "price" on the donor organ? Would this take advantage of the poor? In my view, the value of the gift of a donor organ is nearly immeasurable, far surpassing any of the proposed payments. Just ask a transplant recipient if

he or she could put a price on a new heart. Or ask a rich man what he would be willing to pay for an extra 12 years of life (in our program, the average heart transplant patient lives 12 years after transplantation). The point is that any of these payments would be so small compared with the value of the organ donation that the donation essentially remains a gift. For this reason, I believe payment is ethical. The small payment would serve as a statement by society to the donor family that: "You have given to our society a most precious gift. Thank you." The rich and the poor would be equally entitled to this "thank you." I believe that all elements of our society would take advantage of this benefit just as they use Medicare benefits now.

Cardiac transplantation is the only proven method of extending the lives of those who are failing maximal medical therapy for heart failure. It will never have a major impact upon the 100,000 patients per year who might need it. But, by financially supporting the donor effort, it is entirely possible that we could double the number of donors in Arizona. If we could double the number of transplants at UMC, we could be sure of extending life for over 20 additional patients per year. This translates into an average of 240 years of human life. Can we afford this? Absolutely! And it will not only save money by keeping people out of hospitals, it will also result in many people returning to contribute in many ways to our society.

This is not conjecture on my part. It was proven in The National Heart Transplantation Study that was completed over 16 years ago. We were one of eight centers in the country that participated in that study. We thought transplantation was a good idea then. Now we know. ♥

*Dr. Copeland is chief of cardiovascular and thoracic surgery at the University of Arizona and a co-director of the Sarver Heart Center.*

## Dr. Tsau Joins Cardiothoracic Surgery Team, SHC

Careers in academia appear to run in the family of Pei H. Tsau, MD, the newest member of the UA Cardiovascular and Thoracic Surgery team.

“The tradition began with my grandfather, who was one of the first civil engineers trained in Japan,” she says. “In 1974, my father became one of the first professors of mathematics in Taiwan.”

Without question, Dr. Tsau has carried on the family tradition. After graduating from the UA with honors in 1990, she attended medical school and completed a general surgery residency, including a one-year fellowship in cardiothoracic transplantation and artificial hearts, at the University. She completed the UA’s cardiothoracic surgery program for residency training in June 2002.

As an undergraduate, Dr. Tsau won a number of awards, including the John P. Schaefer Scholarship, the President’s Award for Excellence, the Fansett Scholarship and the Digital Equipment Corporation Scholarship. During her fellowship year, she was awarded a Trainee Award of Excellence by the American Society for Artificial Internal Organs, having presented the resident award paper at an international meeting in New York.

Now that she is a heart surgeon, she has claimed another honor – not only is she among the small group of women surgeons (only 14 percent of surgeons in the United States are women), but she is one of only 20 women cardiothoracic surgeons.

Her approach to dealing with gender issues? Close the gap by mentoring young women in high school and college and hopefully encourage them to pursue careers in science and medicine.

Dr. Tsau also is a strong proponent of

educating patients.

While caring for cardiac patients “challenges the mind,” working with them and their families – teaching them about their conditions, explaining their treatments – is an opportunity for personal growth, she believes.

“I am a better person after being exposed to the environment where it is necessary to be a scientist, a physician and a nurturing person to the patients and their family members.”

Helping patients understand their particular conditions, she says, helps them become better patients, and therefore participate more in their care.

“Being a good physician entails more than just being an excellent technician with a good fund of knowledge,” Dr. Tsau says. “Being a good physician also means becoming a caring and responsive surgeon for the patients and their families.”

Dr. Tsau’s research interests include artificial hearts and immunosuppression, artificial hearts and coagulation, and heparin-coated membranes and coagulations. Her interest in the area was sparked when she was exposed to the CardioWest total artificial heart as a third-year medical student.

One of her research aims is to better understand the coagulation system in order to discover ways to reduce the occurrence of thromboembolic events (such as strokes) in patients on heart assist devices.

“Once patients experience thromboembolism, the consequences are grave,” Dr. Tsau says. “These patients may no longer be good cardiac transplant candidates, and they can develop clinical depression, which can lead to



**Pei H. Tsau, MD**

**MD:** University of Arizona, 1994

**Research Interests:** Coagulation in artificial hearts and mechanical assist devices; immune status in patients with artificial hearts or mechanical assist devices

reduced appetite and physical activity.”

When a thromboembolic event is treated with anticoagulation (using medicines to prevent blood clots), patients run the risk of hemorrhagic bleeding, which can worsen their conditions.

“It is obvious that the best treatment of such problematic complications is prevention,” she says.

Discovering the mechanism that leads to clot formation could avoid the issues of stroke and bleeding altogether.

She thinks the activation of platelets is likely the primary event in thromboembolic events, and has dedicated part of her research to observing the factors that initiate the formation of platelets.

To learn more about Dr. Tsau, visit [www.surgery.arizona.edu](http://www.surgery.arizona.edu). ♥

*No doubt you know of someone who has undergone an Electron-Beam Computed Tomography (EBCT) scan. Perhaps you're wondering if such a scan could shed some light on your own cardiovascular health.*

*In theory, EBCT is a tool to help the patient and the doctor develop a plan to prevent or delay the onset of coronary artery disease (CAD), which is a major medical problem and the number one cause of death in the United States and in most developed countries.*

### How does EBCT work?

EBCT technology, which produces X-ray "slices" of the heart or other parts of the body, can be used to display calcium deposited in the arteries. The greater the calcium score – adjusted for age and sex – the greater the likelihood of atherosclerotic arteries. Calcium is easy to recognize, and can be considered an indication of the "aging" of these arteries.

In some people, cholesterol starts building up in their coronary arteries before the age of 30 and produces streaks and plaque in the lining of the arteries. As a person ages, more cholesterol is deposited in plaque, and a small part of the plaque and the arterial wall become calcified. So only the calcified portion of the plaque and the artery wall, is seen on the EBCT scan. The non-calcified plaque is actually more likely to rupture – especially if it is cholesterol rich – and a ruptured plaque has a greater probability of causing a clot to form

# The Truth About Body Scans

in the coronary artery, producing a heart attack. Therefore, the calcium score is only an indicator of the extent of coronary artery disease and is indirectly related to the occurrence of a heart attack and prognosis.

The EBCT exam of the heart takes less than 15 minutes to complete. It does not require intravenous injections, catheters or injection of X-ray contrast. The cost is approximately \$400. Because the exam's value is unknown, these scans are not covered by insurance.

### How should one decide whether to have an EBCT scan?

The decision should be made after visiting your doctor, who will evaluate your risk of coronary artery disease. Your doctor takes a history, examines you, does an electrocardiogram (ECG) and has blood tests performed to check your cholesterol and other lipid levels, sugar levels and may check other substances, such as C-reactive protein, fibrinogen and homocysteine, which are newer risk factors for coronary artery disease. If you have no symptoms, no diabetes or vascular disease, no family history of early CAD and normal ECG and blood tests, your risk for CAD is low and the EBCT scan is not likely to change the plan for your activity, diet or treatment.

If you have angina or have had a heart attack, diabetes or vascular disease, such as carotid stenosis,

bypass surgery or abdominal aortic aneurysm, you already are known to have vascular disease and the EBCT scan will give you little or no additional information.

If you have risk factors for CAD – such as high blood pressure, high cholesterol or low HDL (good) cholesterol, or you smoke – these factors should be altered to lower your risk. Depending on your family history, and the degree of abnormalities of the exam and testing, you and your doctor may want an added evaluation of your risk for CAD. At this time, an EBCT scan might be an option. If the calcium score is low or zero, you and your doctor might feel more confident in the prescribed plan of treatment. If the calcium score were high, your doctor might suggest a more stringent medical plan of increased medication and closer supervision. You might be motivated to exercise even more, consume even less fat and adhere more closely to the prescribed medications.

However, the true value of EBCT is unknown. If an EBCT scan were done on an egg, the calcium in the shell would show up, but the cholesterol in the yolk would go undetected. But we know that cholesterol is quite significant, because a plaque filled with cholesterol is more likely to rupture and cause a heart attack.

EBCT or "body scans" have also been used to scan the lungs and abdomen. The amount of radiation for a heart scan is equivalent to six chest



X-rays, the lung scan is an additional six X-rays and the abdominal scan is equivalent to 30 chest X-rays. It is difficult to recommend that amount of radiation for a screening test of unknown value.

Individuals who offer EBCT services tell stories of how on occasion an unexpected tumor is found, with the implication that the scan “saved” someone’s life.

On the other hand, even if you think the radiation exposure might be worth the peace of mind, there are numerous cases where a patient had a positive EBCT scan and underwent catheterization only to find no significant obstacles.

### The final word on EBCT

The guidelines of the American Heart Association and the American College of Cardiology consider EBCT as a “possibly useful diagnostic technique in certain patient situations.” But, like most tests, EBCT must be evaluated by a doctor to place the results in the context of the patient’s total health evaluation. EBCT is not a magic eye and is not the ultimate test. It would be wise to consult with your physician before having the EBCT exam and avoid coming to premature conclusions, which could lead to anxiety or panic.

This test is not currently available at University Medical Center, as it is still of questionable value.

Meanwhile, research into other methods – such as MRI, PET scanning and ultrasound – is being conducted at the University of Arizona and other universities to detect vulnerable coronary artery plaques as early as possible to prevent serious consequences.♥

## Dr. Lane Receives \$2.5 M Grant to Study Emotional Triggers of Cardiac Events

A Sarver Heart Center researcher investigating the role stress plays in sudden cardiac death has been awarded a nearly \$2.5 million grant from the National Institutes of Health.

Richard D. Lane, MD, PhD, will receive about \$2.46 million over four years from the NIH’s National Heart, Lung and Blood Institute for his study, titled “Long QT Syndrome: Emotional Triggers of Cardiac Events.”

Long QT Syndrome (LQTS) is a hereditary cardiac syndrome characterized by an abnormality in the electrical properties of the cardiac cycle. The disorder can result in fainting, abnormal heart rhythms and sudden cardiac death. The clinical presentation of LQTS is quite variable, and preliminary research shows that emotions can play a role in triggering cardiac events, especially in patients with one of the two most common genetic forms of the disorder (LQTS2).

The two projects funded by this grant will use state-of-the-art techniques in emotion research. One project will investigate how frequently high-intensity negative or positive emotional states precede clinical events in LQTS patients. The second project will examine whether low-intensity negative or positive emotional states under everyday circumstances affect the electrical stability of the heart, especially in LQTS2 patients.

The findings of Dr. Lane’s research team could provide direction for the care of LQTS patients, as well as a foundation for future research on the mechanisms of sudden death in this and other conditions associated with increased risk for sudden death, such as coronary artery disease.

“Everyone knows that it is possible to die suddenly in the context of sudden, severe emotional stress. Yet we don’t know the mechanisms involved, and thus we can’t do as much as we would like to prevent it,” explains Dr. Lane, a professor of psychiatry, psychology and neuroscience.

“We also don’t understand the role played by everyday lower intensity emotions.

“This is an exciting new line of research that has the potential to delineate the mechanisms of emotion-induced sudden death from the level of regional brain activity all the way down to molecular mechanisms in the heart. New therapeutic and preventive interventions may be possible depending upon how the research turns out.”

This research will be conducted in collaboration with the University of Rochester, which maintains the International LQTS Registry of patients and their families.

In 2001, Dr. Lane received a two-year grant for \$100,000 from the Dana Foundation to study brain activity (using functional magnetic resonance imaging) and cardiac function in patients with the LQTS as they are exposed to emotion-evoking stimuli. The purpose of the grant is to begin to identify the mechanisms by which the brain can trigger abnormal heart rhythms and sudden death in the context of emotion. Sarver Heart Center members Peter Ott, MD, Assistant Professor of Medicine, and Julia Indik, MD, PhD, Cardiology Fellow, serve as co-investigators in this laboratory-based research. ♥

# Diet Books – Waist Aids or Wasted Aides?

By Deborah Pesicka, RD

For many years, in any given week, many of the best-selling books are diet books. So why are more and more Americans becoming overweight or obese each year? The answer isn't easy – as you know if you have tried unsuccessfully to lose weight. The fact is, researchers continue to debate what “diet” works best for weight loss.

This article attempts to shed some light on the subject by reviewing some of the current diet books. But first, let's take a look at some general concepts

about weight loss that can't be disputed. First, calories do count, regardless of whether the calories are from protein, carbohydrate or fat. To lose weight, the total number of calories eaten must be less than the number of calories used by the body. Second, a temporary change in eating habits may result in weight loss, but it won't be maintained without lifelong lifestyle changes. Third, increased activity (or exercise) is essential for weight loss and maintenance.

There are a few techniques that have been shown to aid successful weight loss. They include keeping a record of everything consumed, both food and beverages. A written record helps identify “unaccounted” or “forgotten” calories. Another technique is to eat a broth- or vegetable juice-based soup before a meal, which reduces total caloric intake. Drinking a glass of water has not been shown to have the same effect. Another way to



reduce total caloric intake is to eat slowly, 15 to 20 minutes or longer per meal, and eat smaller, more frequent meals and snacks.

The debate of how much of which nutrient – protein, carbohydrate or fat – is best has recently heated up. It seems accurate to say that there is no one correct amount of those major nutrients for everyone. What does appear to matter is that carbohydrates should be whole grains, which go through less processing, rather than the “refined” white carbohydrates of which we Americans seem to be so fond. Fats should be primarily monounsaturated rather than saturated or trans fatty acids, with more omega 3 fatty acids than omega 6 fatty acids. Leaner choices of protein foods seem to be the most healthful.

We've heard it over and over, but it seems to be more and more correct: a moderate intake of healthful food

choices most of the time is a good rule of thumb.

Each of these diets offers some benefits, some clearly more heart healthful than others. Each diet also offers some potential pitfalls. Which one works for a specific person depends on one's individual personal and health goals. Remember any new diet or exercise program should be discussed with your health care professional, especially if you have a history of heart disease or other disease state. Good

luck with your choice and Good Eating! ♥

*Deborah Pesicka has been practicing as a registered dietitian since 1984. She specialized in diabetes nutrition and is a Certified Diabetes Educator. She was program coordinator of the University Medical Center Care for a Lifetime Program until it was discontinued in 2001. She currently works as a dietitian/diabetes educator in the Diabetes in Pregnancy Clinic at University Physicians, Inc., and as a quality analyst in the Quality Improvement Department at UMC.*

## Ratings Guide



Another source of sound nutrition information may be a better pick



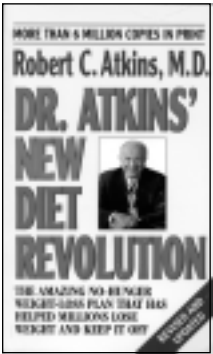
Fair source of sound nutrition information, somewhat dated



Good source of timely and sound nutrition information

## Dr. Atkins New Diet Revolution

Robert Atkins, MD/M. Evans & Co.



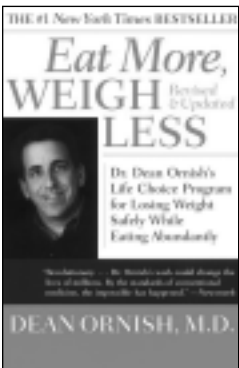
**Theme:** High protein, Low-Carbohydrate

**Potential Benefits:** Emphasizes increased water intake and activity

**Potential Pitfalls:** This diet is high in saturated fat and trans fatty acids. Very low in fiber, calcium, potassium and phytonutrients. Recommends supplements to replace missed nutrients. Excess protein leaches calcium from bone.

## Eat More, Weigh Less

Dean Ornish, MD/Harper



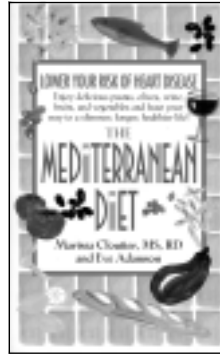
**Theme:** Very low fat, with behavior modification

**Potential Benefits:** Emphasis on increasing intake of whole grain carbohydrates, fruits and vegetables. Whole lifestyle changing program encompassing activity and stress reduction. Nearly vegetarian in food choices.

**Potential Pitfalls:** Difficult to stick with long term. May increase triglycerides and decrease HDL cholesterol in some. Nearly vegetarian in food choices.

## The Mediterranean Diet

Marissa Cloutier, MS, RD & Eve Adamson/Harper Torch



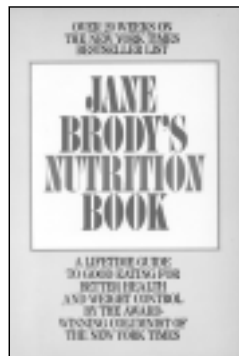
**Theme:** Moderate intake of carbohydrates and fats

**Potential Benefits:** Emphasis on substituting monounsaturated and omega 3 fatty acids for saturated fats. Encourages whole grains, fruits, vegetables, water and increased exercise. Encourages rest and relaxation, meal time with family and friends. Interesting modified food pyramid.

**Potential Pitfalls:** May cause weight gain if monounsaturated and omega 3 fatty acids added, rather than substituted, for saturated fats. Very small amounts of red meat recommended.

## Jane Brody's Nutrition Book

Jane Brody/WW Norton & Co.



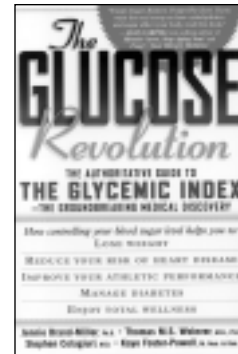
**Theme:** High carbohydrate, low fat

**Potential Benefits:** Emphasis on whole grains, fruits, vegetables and increasing variety of food choices. Encourages low saturated fat intake.

**Potential Pitfalls:** Some outdated information. High carbohydrate intake may increase triglycerides and decrease HDL cholesterol in some.

## The Glucose Revolution

Jennie Brand-Miller, PhD/Marlowe & Co.



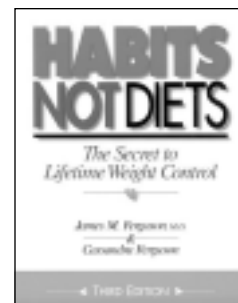
**Theme:** Glycemic Index (choosing carbohydrates that have a smaller effect on glucose levels improves glucose control and reduces calories)

**Potential Benefits:** Emphasizes whole grains, fruits, vegetables, little processing of foods and heart-healthy fats. Encourages increased activity.

**Potential Pitfalls:** May be complicated at first. Amount of carbohydrates eaten deemed of little importance.

## Habits Not Diets: The Secret to Lifetime Weight Control

James M. Ferguson, MD, and Cassandra Ferguson/Bull Publishing



**Theme:** High Carbohydrate, Low Fat

**Potential Benefits:** Emphasis on whole grains, fruits, vegetables and increasing variety of food choices. Encourages low saturated fat intake.

**Potential Pitfalls:** Some outdated information. High carbohydrate intake may increase triglycerides and decrease HDL cholesterol in some.



## HEART NEWS FOR YOU

## To Prevent Heart Disease ... Know Your Numbers

By Gordon A. Ewy, MD  
UA Sarver Heart Center Director

Four decades ago, half of Americans died of cardiovascular disease, a quarter from cancer and a quarter from all other causes combined. We have made progress: the latest statistics reveal that 40 percent of Americans die of cardiovascular disease, 23 percent from cancer and the remainder from all other causes. More importantly, the age-adjusted death rate from cardiovascular disease has fallen, so that the 40 percent die at an older age than did the 50 percent of four decades ago. Although we have made progress, heart disease and stroke continue to be America's number one killer, and it is predicted that cardiovascular disease will soon be the number one killer worldwide.

One major reason that Americans' cardiovascular health continues to be in jeopardy is the epidemic of obesity in the United States (see the previous Newsletter's *Heart News for You*). Obesity predisposes one to diabetes and pre-diabetes, conditions that markedly increase the risk of cardiovascular disease. Other reasons include the fact that 25 percent of Americans continue to smoke, Americans are less physically active, do not have optimal diets, and many at risk of, or who already have, cardiovascular disease are not being adequately treated.

A large percent of individuals with elevated blood pressure, blood lipids, blood sugar and weight are not at "goal" and not enough is being done to bring them to "goal." National surveys continue to show that most individuals taking medication for high blood pressure do not have their blood pressure adequately controlled, most patients with cardiovascular disease under therapy to lower their cholesterol or blood glucose have not reached their goals, most have not reached their healthy weight, etc.

Why is this? One can speculate about the faults of our current health care system, but one potentially solvable problem is that the patient does not know his or her

specific health care goals. The patient must become more involved in their health care decisions. But to make health management decisions (like any management decision), one must know the goal. And most patients (and unfortunately some physicians) do not know what their specific cardiovascular health care goals should be. We thought one way to help would be to develop "To Prevent Heart Disease and Stroke, I Need to Know My Numbers" cards that you can carry in your wallet to assist you in encouraging your physician to help you reach your cardiovascular health treatment goals.

### Blood pressure

The ideal blood pressure is less than 120/80 mm Hg. The top number is the systolic pressure, and the bottom number is the diastolic. Cardiovascular mortality increases with each 10 mm Hg increase in either the systolic or diastolic BP. National guidelines state that patients being treated for hypertension should have a systolic blood pressure (in the doctor's office) of less than 140 mm Hg. This means that at home the systolic pressure should be less than 130 mm Hg. The office blood pressure goal for diabetic patients is 135/85 mm Hg. For patients with kidney (renal) disease, the goal is 130/85 mm Hg., and for diabetics with kidney disease one national guideline committee recommends 130/80 mm Hg and another 125/75 mm Hg. It should be noted that it takes an average of three drugs used concurrently to adequately control most patients' blood pressure.

#### Blood Pressure Goal:

140/90 mm Hg at office  
130/85 mm Hg at home

#### Diabetic BP Goal:

135/85 mm Hg at office

#### Renal disease goal:

130/85 mm Hg at office

#### Diabetic with renal disease:

130/80 or 125/75 mm Hg  
at office

### Cholesterol

Atherosclerosis, which can lead to blockage of the arteries, is caused by a number of risk factors that either produce abnormalities of the endothelium (the delicate inner lining of the entire arterial system), cause inflammation or cause changes in the LDL cholesterol. LDL cholesterol is referred to as "bad" cholesterol. The higher the LDL cholesterol level, the greater the chance of developing a heart attack or stroke. The lower the level, the less chance of developing a heart attack, stroke or peripheral vascular disease.

If you have any evidence of cardiovascular disease, diabetes, or major risk factors, such as family history of premature heart attacks or strokes, your LDL cholesterol should be below 100 mg/dL. There is data to suggest it is better to have the LDL cholesterol level even lower.

#### LDL Cholesterol Goal:

< 100 mg/dL

#### HDL Cholesterol Goal:

> 45 mg/dL

#### Triglyceride Goal:

< 150 mg/dL

### Blood sugar

Diabetes is probably present if your fasting blood sugar (glucose) is greater than 126 mg/dL and definitely present if the blood glucose is greater than 200 mg/dL two hours after 75 gram glucose load. Prediabetes, or so-called "insulin resistance," is probably present if your fasting glucose is between 110 and 125 mg/dL and definitely present if the two hour post-glucose tolerance test glucose is between 140 and 199 mg/dL.

It has been known for some time that diabetic patients are at risk for peripheral vascular disease (at times requiring amputation), heart attack, stroke and kidney failure. Prediabetes or insulin resistance is an important new cardiovascular risk factor that should be aggressively treated.

#### Fasting blood Glucose Goal:

< 100 mg/dL



HEART NEWS FOR YOU

**If I have diabetes or prediabetes, what should my hemoglobin A1c level be?**

When determining the risk of having a heart attack, a person who has already had a heart attack is at highest risk for developing another. Even if they haven't suffered a heart attack, a person who has diabetes has the same risk as someone who has!

Thus the goals of therapy for diabetes are not only to control the cholesterol and other blood lipids, but also to control the blood glucose and the glycosylated hemoglobin (hemoglobin A1c). A fasting blood sugar or glucose tells what the diabetic patient has eaten the previous day but the glycosylated hemoglobin indicates what their glucose control has been like the previous month or so. Cholesterol is not all bad. In fact, cholesterol is essential for many normal bodily functions. However, as noted above, when LDL cholesterol is altered it becomes atherogenic or damaging.

One way to alter LDL cholesterol is to glycosylate it – that is, to add a sugar molecule to the LDL particle. We don't routinely measure glycosylated cholesterol, but physicians can measure glycosylated hemoglobin or hemoglobin A1c.

Hemoglobin A1c Goal:  
< 6.0 mg/dL

**Do I need to quit smoking altogether?**

Yes! Smoking is the most preventable cardiovascular risk factor. People wrongly think, "The damage has already been done, so why quit?" Here's why – within one to three years of quitting, a former smoker's risk of cardiovascular disease is nearly the same as that of someone who never smoked!

For further information on the hazards of smoking, and or how to "kick the butt," we recommend these Web Sites:

- American Lung Association ([www.lungusa.org/partner/quit](http://www.lungusa.org/partner/quit))
- Arizona Department of Health

Services Tobacco Education and Prevention Program ([www.tepp.org/quit/index.html](http://www.tepp.org/quit/index.html)).

Cigarette Consumption Goal: Zero

**Ejection Fraction (EF)**

In future issues of "Heart News for You," I will go into detail about the Sarver Heart Center's heart failure prevention and treatment programs. For now, I will just point out that the hearts of people who have had heart attacks can undergo changes that lead to heart failure. This is especially true if the heart was damaged to the point where its ability to pump has been decreased.

When the normal left ventricle of the heart contracts, it pumps out two-thirds of its contents. Therefore, the normal EF or ejection fraction (the amount of blood pumped out the aorta divided by the amount of blood in the heart when it is full) is about 66 percent. Once the heart's function gets worse (EF < 40%) the patient is at risk for a number of adverse events, including heart failure and sudden death. The patient may feel fine and be without symptoms. However, if your low EF is known, there are a number of medications and/or interventions that can improve heart function and/or prevent deterioration.

LVEF Goal: > 40%

**Ideal Weight and Exercise**

For this discussion, I will refer you again to previous issues of Heart News for You. You need to know your height and weight to get your body mass index. At [www.heart.arizona.edu](http://www.heart.arizona.edu), you can enter your height and weight and get your body mass index, or BMI.

Normal	20 to 25
Overweight	26 to 30
Obese	> 30

Exercise Goal:  
Walk 2 miles a day

**To Prevent Heart Disease and Stroke ... I Need to Know My Numbers**

My blood pressure should be < 140/90 mm Hg at the doctor's office and < 130/80 mm Hg at home. If I am diabetic or have renal disease, my BP at physician's office needs to be 130/85 mm Hg or lower

My cigarette consumption should be zero.

My LDL (bad) cholesterol should be < 100 mg/dL (and perhaps less than 80 mg/dL) if I have had cardiovascular disease or am at high risk (coronary bypass, angioplasty, carotid disease, peripheral vascular disease, heart attack, strong family history, etc.).

My fasting triglycerides should be < 150 mg/dL.

My HDL (good) cholesterol should be > 45 mg/dL.

My weight (BMI) should be less than 25. (See [www.heart.arizona.edu](http://www.heart.arizona.edu) to calculate yours.)

I should walk 2 miles a day

My fasting blood glucose should be < 100 mg/dL

Fasting glucose 110 -126 mg/dL = probably pre-diabetic.

Fasting glucose > 126 mg/dL = probably diabetic.

Hemoglobin A1c > 6.0 mg/dL = probably diabetic.

If diabetic, my blood glucose should be controlled so that my hemoglobin A1c is less than 6.0 mg/dL

If I have had a heart attack, I need to know my "Ejection Fraction." My EF needs to be over 40%. If < 40% I need medications to prevent heart failure.

Note: Cut out this table, fold and carry with you. If you would like a laminated card, please contact the Sarver Heart Center at (800) 665-2328 or [heart@u.arizona.edu](mailto:heart@u.arizona.edu).

University of Arizona  
Sarver Heart Center

**SARVER HEART CENTER  
SCIENTIFIC CONFERENCES  
2002-2003**

12 p.m.-1 p.m., Room 4632  
(Artificial Heart Conference Room)  
Open to physicians

**November 1**

Genetic Polymorphisms That  
Influence Therapeutics for Congestive  
Heart Failure  
Raymond L. Woosley, MD, PhD  
UA Vice President for Health Sciences

**December 6**

Heart Failure Due to Systolic  
Dysfunction  
Gordon A. Ewy, MD  
Director, UA Sarver Heart Center

**January 3**

Heart Failure Due to Diastolic  
Dysfunction  
Gordon A. Ewy, MD  
Director, UA Sarver Heart Center

**February 7**

Biventricular Pacing in Management  
of Heart Failure  
Paul Fenster, MD  
Associate Professor of Medicine  
Peter Ott, MD  
Assistant Professor of Medicine

**March 7**

Heart Failure – National Issues  
Lynne Stevenson, MD  
Clinical Director of Cardiomyopathy  
and Heart Failure  
Associate Professor of Medicine  
Harvard Medical School

**April 4**

Acute Heart Failure Post Cardiac Arrest  
and Cardiopulmonary Resuscitation  
Karl B. Kern, MD  
Professor of Medicine

**May 2**

Heart Failure Due to Alcoholic  
Cardiomyopathy  
Charles Lui, MD  
Associate Professor of Medicine

**June 6**

Alternatives to Transplantation  
Jack Copeland, MD  
Michael Drummond Distinguished  
Professor of Cardiovascular and  
Thoracic Surgery  
Co-Director, UA Sarver Heart Center

## **Cath Lab Marks 20 Years of Safety, Success**

This year marks the 20th anniversary of the Coronary Intervention program at University Medical Center. Since the program's inception, nearly 3,300 coronary angioplasty procedures have been performed, with an exceptionally high rate of safety and success.

The most common therapeutic procedure performed in the Coronary Catheterization Laboratories is angioplasty, in which a blocked coronary artery is opened to increase blood flow to the heart muscle. A thin, flexible tube (catheter) travels through an artery to reach the blockage and then a small balloon at the tip of the tube is inflated, pushing the plaque against the wall of the artery.

It has become standard in most cases to also place a small wire tube inside the artery after the blockage is cleared. The tube, called a stent, is left inside the artery to prevent it from closing again.

Below, Samuel Butman, MD, director of the UMC Coronary Catheterization Laboratories, comments on the advances in the area and future innovations.

### **What were some of the most significant changes in coronary intervention during the past 20 years?**

The most significant change has been the continued evolution of the balloon angioplasty equipment, from a large balloon to smaller catheters and balloons, which allow them to be maneuvered more precisely, increasing success and safety.

### **What has been the single most important innovation?**

Without question, the coronary stent.

### **What are some of the newer procedures coming in the near future?**

We'll see the use of stents coated in substances designed to prevent re-narrowing – or restenosis – of the artery, plus new therapies to detect and prevent early disease of the heart's blood vessels.

### **What are some of the directions that research in coronary intervention is taking?**

Better and better coatings to the stents will evolve. And perhaps even the metal currently used to make the stents will be replaced by something that is biodegradable.

Gene therapy to treat patients that have disease that is inoperable or otherwise untreatable also is promising and will change the lives of countless people in the future.

## Transplant Teaches Lesson in Partnerships

*Nina Gibson suffered from heart failure for 29 years before becoming UMC heart transplant recipient #583 on Oct. 2, 2000. The diagnosis came two months after the transplant – a genetic mutation she may have inherited from her grandfather, Franklin Delano Roosevelt. She and her husband, Nick, were among the first people to make major gift commitments to the endowed chairs in honor of Nina’s doctors, Gordon A. Ewy, MD, and Jack G. Copeland, MD.*

The first time I was introduced to Dr. Copeland, he said, “So ... you want a heart transplant.” Well no, I did not WANT a new heart. I was rather attached to the one I had. But it was no longer able to keep me alive. I would rather think I “needed” a new heart. But Dr. Copeland was right. I would have to want a new heart with determination enough to totally commit to and work with a lifestyle not necessarily familiar to me.

Throughout the transplant process of being poked, prodded, tested, asking questions, confusion, doubt and the most difficult of all, waiting, I began to learn one of the most valuable lessons ever taught. Dr. Copeland was responsible for teaching me about the partnerships of life. I needed to enter into partnerships with many people, some of whom I would never meet. In order to live I had to trust others, and be willing to give my all in return.

The most essential part of the partnership is Dr. Copeland’s ability to assemble one of the most extraordinary teams in the world. Each person is committed to saving lives, to learning, to breaking barriers, solving seemingly insurmountable problems through research and, above all, to personal care for the patients and their families. (Behind Dr. Copeland’s back, many of the transplant patients lovingly call him “Uncle Jack.”)

Prior to my heart transplant I was on a mechanical heart called a Thoratec that I named “Henrietta Heart.” In spite of the device, my other organs continued to fail. When Dr. Copeland visited me, he expressed concern about excessive bleeding and the failure of my kidneys and liver. I kept reminding him not to worry about the wrong end. If he would just find me a heart, everything would be fine!

Right after my transplant I was not myself. I became convinced that Dr. Copeland had decided that I really was not a good candidate and he should take my heart back and give it to someone else. My husband, recognizing the neurological problems I

was having, cajoled me into brushing my teeth for Dr. Copeland so he could observe that I could not even find my mouth with the toothbrush. He realized immediately that I was having a toxic reaction to some of the medications and saw to it that the problem was solved. I quickly regained some power of reasoning.

As soon as Dr. Copeland was able to reason with me, he told me he was going to Germany and that when he returned I had better be out of the hospital and doing well. I accepted the challenge and swore I would not be anywhere around when he returned. I did, however, make sure I knew who had the authority to discharge me in his absence.

Two years later I remain in awe of the expertise, the teamwork, and the contributions to our community, as well as to our individual lives that Dr. Copeland has made. I am in contact with many of Dr. Copeland’s patients and have witnessed the pride, the peace of mind, and the deep gratitude each person feels for this truly remarkable man and what he has brought to the UA Sarver Heart Center. ♥



*Nina is pictured on her horse, Joey, shortly after her heart transplant.*

## A Love for Fast Horses, a Passion for Giving

Maxine M. Piggott's eyes brighten and she grins broadly as she remembers Healer's Star, one of the first horses she purchased. Healer's Star was a Thoroughbred that could run with quarter horses. His race record at the track in Prescott was a source of pride for 32 years before it was broken.

Mrs. Piggott is a renowned owner of horses and has been a supporter of racing for many years. She rarely misses seeing her horses race at Turf Paradise in Phoenix and she was pivotal in protecting the Rillito Park racetrack in Tucson as a significant historic site. Based on her record over the years, a Phoenix race announcer dubbed Maxine, her trainer and her jockey as the "dream team" in a local television program. Most recently she was honored at the Arizona Thoroughbred Breeders Association banquet and introduced as Arizona's "grand dame of horse racing."

She chalks this success up to her humble country roots. Maxine Heasley was born in her grandmother's home in Anderson, Ind. After losing the family farm during the Depression, her father turned to carpentry and helped build the Purdue University field house. She remembers accompanying her grandfather at the age of 5 to funerals and weddings where she would stand on a chair to intone a gospel favorite for those gathered. Her musical talent led to her own hometown radio show on WHBU, during which she played a ukulele and sang the popular songs of the day.

As a young woman she worked at the hotel in Anderson, where she was promoted from coffee shop waitress to switchboard operator. Young Edward Piggott, whose

family owned General Insulating and Manufacturing, often stayed at the hotel on business from nearby Alexandria. He met Maxine as he passed the hotel switchboard making his way to breakfast through the hotel's back hallway.

During the 50 years they were married, they shared a deep love of horses, singing together and building homes

to accommodate a growing Tucson. In addition to designing their home in the foothills, Maxine designed, furnished and outfitted a number of duplexes and triplexes.

In addition to her support of horse racing, Mrs. Piggott has been a generous contributor to cardiovascular research at the Sarver Heart Center.

"I love to give. I know what it is to be poor and also what it is to be fortunate enough to have enough to give some away. I am grateful to be surrounded by good caregivers, doctors and friends. I know there are some people that cannot even afford to buy their medications, so I am very

grateful for all I have and it makes me feel good to give."

Just as when she recalls her first horse, Mrs. Piggott's eyes light up and she smiles as she counts the Sarver Heart Center and her physician, Dr. Ewy among the reasons for her long and a productive life. Her mother and father died at a relatively young age. Despite recent diagnosis of heart disease and a 40-year battle against diabetes, she continues to thrive and enjoy success with her beloved horses. Perhaps Healer's Star was more than just the name of her first horse. Perhaps it was also a bit of a portent for Mrs. Piggott's health and her role in supporting cardiovascular research.





## AZ Team Excels at Transplant Games

The 28-member Team Arizona brought 18 medals home from the 2002 U.S. Transplant Games held at Disney's Wide World of Sports in Orlando, Fla.

"Better yet, they all came back with great experiences, new friends and a renewed spirit and commitment to the transplant community," Team Arizona Manager John Landers wrote in a letter to the sponsors who helped fund the trip.

The U.S. Transplant Games is a four-day, Olympic-style event for recipients of a donated kidney, heart, liver, lung, pancreas or bone marrow. The Games were sponsored by Novartis Pharmaceuticals Corporation and presented by the National Kidney Foundation.

The biennial Games are the largest gathering of transplant recipients and donor families in the world.

For more information on donating organs, please call the Donor Network of Arizona at (800) 447-9477, or visit the DNA Web site at [www.dnaz.org](http://www.dnaz.org).

### Team Arizona Results

#### Tennis

Jill Bowers – Silver

#### Track and Field

Doug McSpadden – 1500M Gold

Jim Kluger – 400M – Bronze

Harold Jones – Shot Put – Gold

#### Badminton

Connie Wilkins – Silver

#### Bowling

Kelsey Crescenzo – Bronze

#### Swimming

Alan Shipley\* – 500Y Free – Silver, 50Y – Bronze

Brianna Bobertz – 110Y Breast Stroke – Gold, 50Y Breast – Silver

#### 5K Road Race

Doug McSpadden – Gold

#### Table Tennis

Jon Berry\* – Bronze

#### Cycling

Robert Ramirez – 1K Silver, 20K – Silver

Jill Bowers – 1K Gold, 20K – Gold

Bill Wohl\* – 1K Silver, 20K – Silver

(Ramirez and Wohl competed in different age brackets)

\* UMC heart recipients



Paul McDonagh, PhD, and Grace Davis-Gorman, a member of his research team, pose in front of the flow cytometer.

## 212 Contributors to Thank for New Research Tool

The Sarver Heart Center is the proud new owner of a Becton Dickinson FACSCalibur Flow Cytometer.

The new addition, delivered recently to the Sarver Heart Center's core laboratory, is a state-of-the-art cell analytical device made possible by generous donations to the Center's equipment fund. Among its functions are immunophenotyping cells (determining specific cell type and characteristics), counting cells, sorting cells and analyzing DNA.

Some of the research that will incorporate the flow cytometer:

- ♥ Jack Copeland, MD, Alexandre Le Guyader, MD, and Paul McDonagh, PhD, are using the equipment to investigate the role of inflammatory blood cells in the pro-thrombotic condition seen in artificial heart patients.
- ♥ Dr. McDonagh, PhD, will use the device for ongoing studies aimed at determining the cellular mechanisms of blood platelet and white cell activation in type 2 diabetes.
- ♥ Bruce Coull, MD, and Leslie Ritter, RN, PhD, are using the flow cytometer to delineate the expression of adhesion proteins on leukocytes from stroke patients.
- ♥ Doug Larson, PhD, is using the equipment to study endothelial cell apoptosis as well as fibroblast DDR2 expression in the etiology of cardiac remodeling following infarction.
- ♥ Mohamed Gaballa, PhD, is using the device and a panel of antibodies to fractionate bone marrow stem cells.

It is expected that the device will benefit many other areas of research at the Sarver Heart Center.

## 2002 SHC Awards

Each year, the Cardiology faculty select two outstanding residents to receive The Charles W. Hall Jr. Memorial Award. The cardiology fellows also present two awards – one for teaching and one for mentoring.



Fellow Alex Vasquez, MD, presents the Teaching Award to Joseph S. Alpert, MD.

### Charles W. Hall Jr. Memorial Award

Chad Morse, MD  
Department of  
Medicine Resident

Elizabeth Juneman,  
MD  
Department of  
Medicine Resident

### SHC Teaching Award

Joseph S. Alpert, MD

### SHC Mentor Award

Hoang Thai, MD

## UMC Surgeons to Help Evaluate New Heart Valve

Surgeons at University Medical Center will participate in a study of a new mechanical heart valve designed to perform better than existing prosthetic valves.

The Medtronic Advantage valve consists of a cylindrical housing and two leaflets, all made out of pyrolytic carbon – an extremely hard material. The leaflets open almost 90 degrees and are designed to cause less blood turbulence. In combination with an excellent pivot “washing” system, both features decrease the possibility of blood clots, says Jack G. Copeland, MD, chief of cardiothoracic surgery at the UA College of Medicine and co-director of the Sarver Heart Center.

The valve can be used to replace either the aortic valve or the mitral valve and is available in eight sizes.

Several surgical teams nationwide are testing the valve, which is not available for public use. The U.S. Food and Drug Administration has granted an investigational device exemption, which allows study of the device.

At UMC, the implants will be performed by Dr. Copeland and Francisco Arabia, MD.

## UMC Heart Care Among Best in the Nation

The care provided by Sarver Heart Center doctors and surgeons has again been recognized as among the best in the country.

*U.S. News & World Report's* annual guide “America’s Best Hospitals” ranks University Medical Center 38th in Heart and Heart Surgery. UMC was one of only five western centers to be included. The others were: Stanford University Hospital; UCLA Medical Center; University of California, San Francisco Medical Center; and University of California, Davis Medical Center.

*U.S. News*, in conjunction with the National Opinion Research Center, objectively assessed hospital care for 17 specialties at more than 1,958 hospitals nationwide. The publication then ranks the top 50 hospitals in the nation in those 17 specialties. Rankings are based on reputation and various medical data.

Other specialties at UMC that were ranked:

- 18th Neurology and Neurosurgery
- 25th Cancer
- 42nd Gynecology
- 46th Rheumatology

## New Members of the Sarver Heart Center

**Marietta Anthony, PhD**  
UA Associate Vice President  
for Women’s Health Research

**Marc D. Berg, MD**  
Assistant Professor  
of Clinical Pediatrics

**Ranjan Dahiya, MD**  
Cardiology Fellow

**Bao-Khanh Do, MD**  
Cardiology Fellow

**Robert D. Pascotto, MD**  
Cardiothoracic Surgery Fellow

**Daniel S. Woolley, MD**  
Assistant Professor  
of Clinical Surgery

## Calling All Volunteers!

Would you like to donate your talents and skills to help the Sarver Heart Center?

We are seeking volunteers to assist the staff with daily tasks plus special projects. Hours would be flexible and requests for specific job assignments are welcome.

If you are interested in this opportunity to help with the necessary work of the Sarver Heart Center, please call Volunteer Coordinator Bob Preble at 626-1232.

## Drs. Ewy, Lui Present at World Congress

Charles Lui, MD, and Gordon A. Ewy, MD, were invited speakers at the International Academy of Cardiology's 8th World Congress on Heart Failure, held in Washington, DC, this summer.

Dr. Lui presented preliminary research on alcoholic cardiomyopathy, in which he found that animals fed alcohol daily did not develop heart failure unless their diets also were deficient in selenium and vitamin E. He presently has National Institutes of Health grants pending to fund definitive studies.

Dr. Ewy described the optimal methods of determining the correct amount of diuretics for patients with chronic heart failure – an extremely important feature of the medical management of those patients.

## Heart-Safe Week Declared in Tucson

The Tucson City Council declared the week of Oct. 27 as "Tucson – A Heart Safe Community Week." The declaration recognizes an initiative of the Sarver Heart Center, the Tucson Fire Department and the American Red Cross-Southern Arizona Chapter. The three have formed a partnership with a goal of making Tucson one of the nation's most "heart-safe" communities through education, a simplified version of CPR, AED (automated external defibrillator) training and rapid access to AEDs. For more information about this effort, or the Heart Center's AED Registration and Education program (SHARE), call Lani Clark at 626-4883.



## Take Heart

The Sarver Center presented its second annual public education conference, "Take Heart ~ How You Can Prevent Heart Disease & Stroke," in Prescott on Aug. 17. The program was sponsored by Jim and Linda Lee of The Ranch at Prescott, pictured above with UA President Peter Likins, who gave a welcoming address to participants. In the photo at right, exercise physiologist Lawton Snyder demonstrates simple strength training moves with one of the participants.



## Recipients of 2002 SHC Research Grants

### The Stanley D. Means Heart Disease Research Award

- Kathryn L. Bates, DO – Mechanisms of enhanced vasorelaxation mediated by HGM-CoA reductase inhibitor, simvastatin, in ischemic heart failure in vivo
- Jon Brower – Cardiopulmonary Resuscitation
- Alejandro Vasquez, MD – Amiodarone in

left ventricular dysfunction: an anti-inflammatory versus an antiarrhythmic effect

### The Mary Lou Hemmler Arnold Award for Heart Disease, Stroke and Vascular Research

Irwin Flink, PhD – Identification of the signal that stimulates cell cycle re-entry of cardiomyocytes during heart regeneration in the salamander: A model system for re-

pair of the human myocardium

**The William J. "Billy" Gieszl Endowment for Heart Research**  
Ian Jongewaard, PhD – Gene expression profiling during heart valve development using cDNA microarray analysis

**The Mark and Emma Schiffman Endowment Funds**  
Joseph Heidenreich – Cardiopulmonary Resuscitation

### The Murcott Cardiovascular Research Award

Hoang Thai, MD – Modulation of impaired nitric oxide mediated endothelial dependent vasorelaxation in congestive heart failure through beta-3 adrenergic receptor activity

**The Lillian Bilyu and John J. Banchi Fellowship**  
(Recipients are medical students)

• Pat Chhuon – Heart regeneration in a parabiologic amphibian model

• Christian Kirman – Genomic actions of thyroid hormone analogs

• Kamlesh Patel – Does blood glucose management attenuate chronic platelet and leukocyte activation in Type 2 diabetes?



## FROM THE DIRECTOR



**B**ack when we completed the fund raising for our building, the Sarver Heart Center Advisory Board set its sights on new priorities, including a suggestion that we identify and publish a list of needed research equipment. Doing so, the board felt, would enable donors who wished to contribute to the most urgent

needs to know exactly how their gifts would be used. It also was seen as a means of encouraging significant gifts that were not of the size necessary to establish an endowment, which requires a minimum of \$25,000.

Despite their size, all gifts are significant to us – like the \$5 that arrives each year from a nun – and combine to contribute to the goal we share with you: “... a future free of heart and vascular disease.”

The board’s idea worked. And thanks to the board and you, our friends and supporters, we recently purchased a sorely needed addition to the Sarver Heart Center core laboratory (see page 13). Core laboratories contain rather expensive pieces of equipment that are shared by several different researchers. These pieces of equipment frequently are robotic in nature, performing tasks on cells, serum, etc., hundreds of times faster than a technician can. It was units like this that allowed scientists to complete the human genome project decades earlier than would have been possible without them.

Our newest purchase can separate cells and, with the use of special florescent staining, quickly identify large numbers of specific abnormal cells to determine their effect on the patient or the effect of therapy. These include stem cells, cells from the endothelium (the delicate inter lining of all of our arterial blood vessels, normal or not) and white cells.

A total of 212 gifts helped purchase of this equipment. And without even the smallest one, we could not have bought it.

We are blessed by your continued support. Thank you.

Sincerely,

Gordon A. Ewy, MD

Director, UA Sarver Heart Center

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.

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