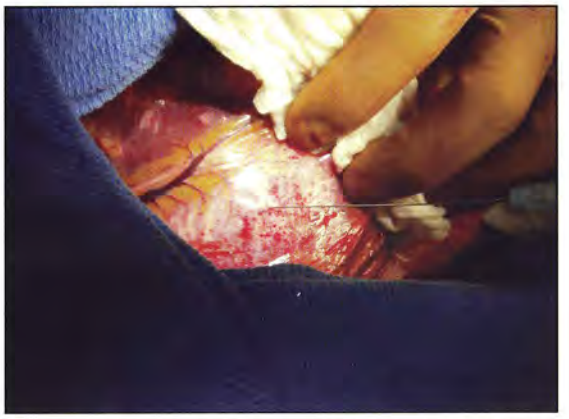
CV QUARTERLY
NEWSLETTER
Serving The Arizona Heart Hospital Medical Staff

Autologous Myoblast Transplantation Safe and Feasible at Three Years



Cardiologists inject millions of skeletal muscle cells directly into the area of a patient's myocardial infarction to promote the growth of new, viable heart tissue.

Autologous myoblast transplantation (AMT) remains feasible and safe in patients with myocardial infarction (MI) undergoing coronary artery bypass grafting (CABG) at three years follow-up, according to a U.S. multi-center trial.

Nabil Dib, MD, Chief of Cardiovascular Research at the Arizona Heart Institute and principal investigator of the myoblast study, presented the 36-month follow-up data in March in the *Late-Breaking Clinical Trials: Mechanisms and New Therapeutic Approaches* at the American College of Cardiology 54th Annual Scientific Session in Orlando, Fla.

In AMT, skeletal muscle cells, or myoblasts, are taken from the patient's thigh and cultured for several weeks. They are then injected into the heart, at the area of the infarction, to promote the growth of new, viable heart tissue. "The ultimate goal of AMT is to heal the heart after MI and improve its pumping ability," said Dr. Dib.

In the feasibility and safety trial, 24 patients with a prior myocardial infarction and a left ventricular ejection fraction less than 40 percent who were scheduled to undergo elective CABG were given AMT injections in one of four escalating doses, ranging from 10 million to 300 million cells. Post-procedural monitoring included positron emission tomography (PET) and magnetic resonance imaging (MRI). With a follow-up extending out to three years, the safety of the procedure remains excellent, with no perioperative complications. PET and MRI scans show evidence for new heart tissue formation, and heart function has increased from 21 percent to 34 percent, with an improvement of patient's quality of life, said Dr. Dib.

Signs of Improvement

Phase I safety trial passes three-month mark; gives hope to first patient

In November 2004, using a revolutionary three-dimensional imaging system, doctors injected via catheter, millions of the patient's harvested skeletal muscle cells (myoblasts) that were taken from his leg, into his damaged heart muscle. It was the first time in the United States myoblast transplantation had been performed without open heart surgery using a color-coded mapping system via catheter. The color-coded mapping system, called NOGA mapping, allows doctors to see precisely where the scar tissue is and target those exact areas.

"These injections unleash the healing power of millions of myoblast cells. They fuse together and start to form tissue at three days and in three months they express protein similar to the heart muscle protein and they become cardiac-like tissue," said Nabil Dib, MD, Chief of Cardiovascular Research at the Arizona Heart Institute and principal investigator of the myoblast study.

John Andrus, a father of four and internal medicine doctor near Lafayette, La., was the first patient selected in this nationwide-clinical trial at the Arizona Heart Institute and Arizona Heart Hospital, using the country's first FDA approved three-dimensional delivery system of myoblast transplantation via catheter. Andrus suffered a major heart attack in January of 2004.

On March 3, 2005, physicians at the Arizona Heart Institute and Hospital used the NOGA mapping technology to track the progress of the cell growth in Andrus' heart. Evidence has shown that new muscle tissue has developed in the areas where the Andrus received the myoblast injections. Before the procedure, his heart had the ability to pump at 2.6 liters per minute. After three months, Andrus' heart has the ability to pump at 3.5 liters per minute, showing a 30 percent improvement. A normal heart has the ability to pump 5 liters per minute. After three months, Andrus is able to walk for

— *continued on page 3*

New Cells for Heart Muscle: How Can It Be?

Once a patient has suffered a heart attack, the heart cells do not regenerate, so damage to the heart has always been considered permanent, resulting eventually in heart failure. Unlike heart muscle, skeletal muscle cells (myoblasts) can regenerate themselves. These super "powerhouse" cells (immature cells that become muscle cells) can be removed from the thigh and cultured in a laboratory, where the cells grow in the millions over a period of several weeks. These new cells are then injected directly into heart muscle, where they take on the characteristics of new cardiac muscle cells.

Promising Data

Surgeons encouraged by one-year results of PVD procedure

The SilverHawk uses a tiny rotating blade the size of a grain of rice to shave plaque from the artery walls to restore normal blood flow.

The Arizona Heart Institute & Arizona Heart Hospital are among the first research centers in the country to offer patients suffering from severe leg pain known as peripheral vascular disease (PVD) another alternative treatment. PVD is a painful condition where fat and cholesterol buildup interrupt blood flow to the legs. It affects nearly 12 million people in the United States. At least 40 percent of them also suffer from coronary artery disease (CAD).

Results after one year on the Silverhawk Plaque Excision System were presented during the 18th Annual International Congress Endovascular Interventions in February. Vascular surgeon Venkatesh Ramaiah, MD, was among the first to use this FDA-approved device at the Arizona Heart Hospital. A tiny rotating blade the size of a grain of rice shaves away plaque from inside the blocked artery walls to restore blood flow to the legs and feet. As the plaque is cut away, it is collected in the tip of the Silverhawk device and then removed from the patient. The procedure is catheter-based.

"The Silverhawk is about the size of a number two pencil. It's like a carpenter's tool that shaves off plaque," said Dr. Ramaiah. Since June 2003 when the FDA approved the Silverhawk device, 220 patients have undergone the Silverhawk Plaque Excision System at AzHH. Data is available after a one-year follow up for 102 patients. Eighty-six percent of those patient's arteries have remained open after one-year, with no repeated treatment. The patients reported on during Congress were treated for blockages located in the arteries above the knee, and were among those with the most severe cases of PVD.

In hospitals across the United States, plaque excision has helped alleviate severe leg pain for thousands of patients. In many cases, it has successfully saved the legs of patients who were scheduled for limb amputation after other peripheral interventions failed. Each year, at least 150,000 amputations are performed as a result of complications of PVD. Many of these patients are diabetics.

Previous treatments for PVD included lasers, atherectomy, balloon catheters, stents, endoluminal grafts and open bypass surgery. "Patients often had a lengthy hospital stay, but with the Silverhawk Plaque Excision System, the average stay is 1.2 days," said Dr. Ramaiah. The recent medical news suggests doctors may finally have a better way to address this debilitating condition. "We are very encouraged by the results," said Dr. Ramaiah.

Although the device has been approved only for use below the groin, it may one day be a common tool to remove blockages in arteries to the heart, a procedure that could lessen the need for angioplasties and bypasses.

AzHH Named One of Solucient's Top Cardiovascular Hospitals

Arizona Heart Hospital was recently named one of the nation's 100 Top Cardiovascular Hospitals in the "Community Hospitals" category by Evanston, Ill.-based Solucient®.

The annual Solucient 100 Top Hospitals®: Cardiovascular Benchmarks for Success study objectively measures performance in cardiovascular services on key criteria at the nation's top performing acute-care hospitals. This is the second time Arizona Heart Hospital has been recognized with this honor.

"We are proud to be one of the nation's Top 100 cardiovascular hospitals named by Solucient," said Ken Howell, Chief Executive Officer of Arizona Heart Hospital. "This honor recognizes the commitment of our physicians and employees to provide excellence in patient care," he added.

Among the key findings of the study:

- Although they are sicker than ever before, more coronary bypass patients across the nation are surviving surgery, and at higher than anticipated rates. The Solucient 100 Top Hospitals® Cardiovascular award winners are leading the nation in this new trend.
- The results showed a significant increase in the severity of co-morbidities and complications, which translated into a higher "expected" death rate of five more patients per 1000 by 2003. However, contrary to this expected rise in CABG mortality, the study shows the reverse: a significant *decrease* in the actual death rate of five patients per 1000 by 2003.
- If cardiovascular services in all acute-care hospitals performed at the same level as the hospitals with the nation's top cardiovascular services, 4,200 additional cardiovascular patients could survive each year; and an additional 1,600 patients could be complication-free.
- Winning hospitals are 35 percent less likely than non-winners to have post-operative infections and 20 percent less likely than non-winners to have post-operative hemorrhage for patients undergoing CABG or percutaneous coronary interventions (PCI).
- Winning hospitals annually perform twice as many bypass surgeries and PCIs, including angioplasties, as their peers.
- Cardiovascular patients at winning hospitals return to everyday life faster than those at non-winning hospitals. Patients at the winning hospitals were released more than a half-day earlier than patients at peer hospitals.
- Average cardiovascular-related costs for benchmark hospitals were nearly 13 percent lower than at peer hospitals.

The sixth edition of the Solucient 100 Top Hospitals®: Cardiovascular Benchmarks for Success study analyzed acute-care hospitals nationwide using detailed empirical performance data from publicly available Medicare MedPAR data and Medicare cost reports. The measures were calculated for three classes of hospitals with the following number of winners in each:

- Teaching with Cardiovascular Residency Programs - 30 winners
- Teaching without Cardiovascular Residency Programs - 40 winners
- Community - 30 winners

Solucient® scored facilities in seven key performance areas: risk-adjusted medical mortality, risk-adjusted surgical mortality, complications, percentage of CABG patients with internal mammary artery use, procedure volume, severity-adjusted average length of stay, and wage and severity-adjusted average cost. More information on this study is available at www.100tophospitals.com.

New Study in Cell Research

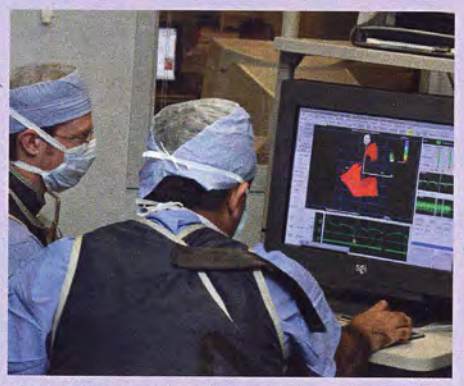
By Leslie Grow, BSE, Clinical Research Coordinator

The Gene/Cell Research department at the Arizona Heart Institute, under the direction of Nabil Dib, MD, has an exciting new study designed for patients who have experienced their first acute myocardial infarction. Osiris Therapeutics of Baltimore, Maryland, is a clinical stage biotechnology company that was founded to commercialize human Mesenchymal Stem Cell (hMSCs) products from adult bone marrow. The ex vivo cultured human Mesenchymal product, Provacel™, is manufactured at their facility under the Food and Drug Administration's standards. This product will be available to select sites across the United States, which are participating in the research protocol. The Arizona Heart Institute is in the final planning stages and is hoping for IRB approval by mid-April.

Within this Osiris trial, there are two separate portions. The first study is designed to test the safety and efficacy of the product by using escalating dosages of stem cells. There will be 48 patients enrolled countrywide, and each will be randomized into a cohort in a 2:1 ration of active cells to placebo. If interested in participation, each patient will be rigorously screened to determine eligibility for enrollment into the study. All study-related procedures, testing, and follow-up will occur within the Arizona Heart Institute, Arizona Heart Hospital, and select affiliates. The follow-up involved in this portion of the trial is six months in duration. The second study is the long-term follow-up portion of the Osiris trial and will monitor patients until two years post-infusion of the hMSCs.

Further information can be obtained by contacting Kareem Sheikh, Study Coordinator, at ksheikh@azheart.com or Nabil Dib, MD, Medical Director in the Gene/Cell Research Department of the Arizona Heart Institute, at (602) 266-2200.

– *Signs of Improvement (continued from page 1)*



Three-dimensional NOGA mapping is used to precisely deliver the myoblast skeletal muscle cells into damaged areas of a patient's heart via catheter.

15 minutes, an improvement from the eight minutes he could walk three months ago.

Andrus received 30 million myoblast cells, the smallest number allowed in this clinical trial. In six months, qualified patients will receive 300 million myoblast cells, the maximum amount approved by the FDA. After the trial, researchers will be able to determine the amount of improvement in the quality of life for these patients.

Since his heart attack, Andrus has not been able to be an "active father," practice medicine or spend time on his favorite hobby, playing drums in a 'rhythm and blues' band. Andrus hopes myoblast transplantation will give him and patients like him the overtime their heart needs for life.

The Arizona Heart Institute is now recruiting volunteers for the next part of this study. Researchers are optimistic myoblast transplantation will be available to the general public in four years. Patients interested in qualifying for myoblast transplantation study can call 1-877-707-3535 or visit www.azheart.com.

Myoblast Timeline at Arizona Heart Institute and Arizona Heart Hospital

2000: First myoblast transplantation during open chest surgery in conjunction with bypass surgery at the Arizona Heart Hospital. Today, the patient is healthy and active, and still practices as a dentist.

September 22, 2004: AHI & AzHH announce FDA approval of myoblast transplantation using a 3-D guidance technology via catheter. Biopsy performed on John Andrus' thigh to culture millions of his own skeletal muscle cells. Cells cultured in lab for six weeks.

November 30, 2004: Historic myoblast transplantation via catheter using 3-D NOGA mapping technology with patient John Andrus.

March 3, 2005: Three-month follow-up of nation's first skeletal muscle cell transplant into a patient's damaged heart using new technology delivered via catheter. Patient showed signs of improvement in both heart function, in which he increased 30 percent to pump 3.5 liters per minute, and in exercise capacity, gaining the ability to walk for 15 minutes, compared to the eight minutes he could walk three months ago.

New AHI Physician

Arizona Heart Hospital welcomes the following physician to the Arizona Heart Institute staff.

Arun D. Sherma, MD, FACC, FRCP, CSPQ

Non-invasive Cardiologist

Dr. Arun D. Sherma joined the Arizona Heart Institute (AHI) in 2004 as a Non-Invasive Cardiologist. He is board certified in Cardiovascular Disease and Internal Medicine. Dr. Sherma received his medical degree from the University of Ottawa in Ottawa, Canada. He completed his Internal Medicine Residency at the Mayo Clinic in Rochester, Minn., and his Cardiology Fellowship at Ottawa Heart Institute at the University of Ottawa, Canada.

Dr. Sherma is a fellow of the American College of Cardiology and Fellow of the Royal College of Physicians in Canada. His research interest includes Cardiac Ultrasound and Congestive Heart Failure. Dr. Sherma provides services at the AHI Casa Grande and Chandler office.

ARIZONA HEART HOSPITAL
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CV Quarterly

The editor welcomes articles of interest, letters, comments and questions. Please direct correspondence to Lisa Guinn, Community Relations, 1930 E. Thomas Rd., Phoenix, AZ 85016. E-mail: Lisa.Guinn@azhearthospital.com. Phone: (602) 532-2187

Our Vision: The Arizona Heart Hospital's vision of the future is an integrated health care system that achieves a dominant place in tomorrow's health care market by providing high quality, cost-effective cardiovascular services that meet the needs of our communities.

Our Mission: The Arizona Heart Hospital, through partnering with physicians and employees, is committed to delivering state-of-the-art cardiovascular care in a professional, caring, patient-focused setting, which will enhance the quality of life for our patients and their families.

Our Values: The success of the Arizona Heart Hospital will be achieved through our commitment to:

High quality
Excellence
Awareness
Respect
Teamwork
Community
Accountability
Results
Expertise

New Medical Staff

Arizona Heart Hospital welcomes the newest members of its medical staff effective March 30, 2005.

Department of Medicine

Van A. Gauby, MD – Emergency Medicine
Anis Hanna, MD – Internal Medicine
Marvin B. Padnick, MD – Cardiology
Kris K. Samaddar, MD – Emergency Medicine
Mark Seifert, MD – Cardiology/Electrophysiology
Arun DasGupta Sherma, MD – Cardiology
Kari B. Shmul, PA-C – Physician Assistant
ThanhVan Tran, MD – Emergency Medicine

Department of Surgery

Brian Allshouse, PA-C – Physician Assistant
Luis Dominguez, MD – Anesthesiology
Curtis Erickson, MD – Cardiovascular Surgery
James Ferguson, CCP – Perfusionist
Laurie Heltzel, PA-C – Physician Assistant
Andreas Schilling, MD – Radiology
P. Randy Stout, CCP – Perfusionist
Margaret Taylor, CCP – Perfusionist

The Arizona Heart Hospital practices an open medical staff model and invites all interested physicians to join. For more information, please call Joyce Day, Medical Staffing Coordinator, at (602) 532-1022.

Important Phone Numbers

Arizona Heart Hospital	602-532-1000
Ken Howell, President/CEO	602-532-1010
Edward B. Diethrich, M.D., Medical Director	602-532-2030
Scott Bailey, VP Finance	602-532-1016
Janet Coates, VP Clinical Services	602-532-1012
Kristi McShay, VP Business Development	602-532-1009
Joyce Day, Medical Staff Coordinator	602-532-1022
ACT Program 24/7	800-228-2119
Cath Lab Central Scheduling	602-532-2100
Medical Records	602-532-1080