



**WHEN EXPERIENCE COUNTS**  
USC heart surgeons Vaughn Starnes, left, and Craig Baker perform a coronary artery bypass and mitral valve repair at USC University Hospital.

**USC's cardiac doctors are breaking down the barriers between subspecialties to come up with a unique treatment plan for each patient.**

BY SARA REEVE AND KATIE NEITH

# How Can You Mend a Broken Heart?

**D**EALING WITH HEART TROUBLE CAN BE A SCARY process. Being overwhelmed by different doctors and different options and opinions can be even scarier. USC offers a solution.

“Normally when patients go to see a doctor, they get different opinions from different doctors – maybe one is a surgeon, one is a cardiologist and one is an interventional cardiologist,” says Vaughn A. Starnes, founding director of the USC Cardiovascular Thoracic Institute and surgeon-in-chief of USC University Hospital and USC Norris Cancer Hospital. “Our goal in building the institute was to create an environment where a patient can come for treatment, knowing that a variety of doctors and specialists have collaborated to find the best possible option.

Founded in 2006, the innovative institute brings cardiothoracic and vascular surgeons, cardiologists, pulmonologists and basic scientists together to provide comprehensive, interdisciplinary patient care.

Leslie Saxon, a renowned specialist in diagnosis and treatment of arrhythmias and chief of cardiovascular medicine at the Keck School of Medicine of USC, says that treating a cardiac patient as a consumer sets USC apart from the field.

“Let’s say a patient comes into an institution with an abnormal heart rhythm and sees a cardiologist,” she says. “For all sorts of economic or other reasons, a cardiologist may not want to refer that patient to a subspecialist who can cure that arrhythmia. We don’t have any of those sorts of barriers here.”

In the case of a very common rhythm disorder called atrial fibrillation, all USC

patients are reviewed by a team of medical and surgical specialists who work together to plan treatment and follow-up care. This cooperation strives to ensure that a broad view is taken, and that the patient will have access to all available treatment options.

“Often with patients with particularly complex disease, the best solutions for the patient require that we all work together,” says Saxon. “The patient may need surgery, and a procedure from a cardiologist and prescription. The patient may ultimately end up being treated by one of our vascular specialists who perform stent placement, and this person may be an interventional cardiologist, vascular or heart surgeon, depending on the details of that particular patient’s problem. We think that we have a model that works beautifully for patients.”

When surgery is required, the institute’s

surgeons bring a lot of experience to the table. Under Starnes’ leadership, USC surgeons have performed more than 15,000 open-heart surgeries for valve repair and replacement and coronary artery bypass, and more than 10,000 surgeries for diseases of the lungs, esophagus and chest wall.

According to Ray Matthews, professor of clinical medicine at the Keck School and director of interventional cardiology at USC University Hospital, one of the best examples of merging different techniques for better heart care is a growing interest in replacing heart valves without major surgery. He points out that expertise is still needed from surgeons to help guide interventional cardiologists in exploring new, minimally invasive options for valve replacement.

“Heart treatment at USC is centered on what’s best for the patient, not on what I think I can do best,” says Matthews. “However, even if your care is patient-centered, you still have to get the right people on the bus, in terms of skilled physicians. And I think we have them.”

Matthews is an interventional cardiologist, meaning he specializes in catheter-based treatments for heart disease. By inserting catheters into major arteries, such as the femoral artery in the thigh, he can reach the heart without the need for major surgery.

“We are able to gain access to the circulation system and open up other arteries that may be blocked from supplying sufficient



In addition to patient care, Cesario and his colleagues – including Saxon – have an active research program to evaluate new and better ways to treat atrial fibrillation. The doctors are also examining better ways to diagnose cardiac arrhythmias with wireless monitors and researching cutting-edge implantable devices that will be able to monitor left atrial pressure and deliver cardiac resynchronization for heart failure patients.

**OPTIONS FOR HEART PATIENTS** Interventional cardiologist Ray Matthews says heart treatment at USC is centered on what's best for the patient.

blood to the brain, kidneys and extremities," he explains.

Matthews and his team are also able to use interventional cardiology to close defects within the heart by placing specialized devices via catheters. In addition, they can perform diagnostic techniques that measure blood pressure and flow, and tell the narrowness of heart valves or arteries.

Matthews enjoys working within the cardiovascular institute because of the unique framework that gathers medical specialists in heart care to work together, rather than compete for patients.

"For the majority of patients, we get each other's opinion to decide the best treatment plan," he says. "This gives balance to the patients, as they aren't pigeonholed into being treated by the first doctor they see."

Matthews emphasizes this collaborative spirit also is important in exploring new technologies.

"It only makes sense that we take advantage of each other's expertise," he says.

For David Cesario, a recent recruit to the Department of Medicine at the Keck School, heart care is all about making connections – electrical connections. As director of cardiac electrophysiology in the division of cardiovascular medicine, he provides clinical heart care by applying the science of treating the electrical activities of the heart.

"Anyone who has an abnormal heartbeat – either too fast or too slow – can benefit from seeing a cardiac electrophysiologist," says Cesario. "This can be anyone who feels extra or rapid heartbeats or notices a low pulse rate that can present as fatigue or

lightheadedness."

Some common problems treated by cardiac electrophysiologists are atrial fibrillation – the most common arrhythmia, which can cause significant morbidity and mortality – and slow heart rhythms that require pacemaker implantation.

"Cardiac electrophysiology fits into the larger institute because we focus on one particular heart problem, namely abnormal heart rhythms," says Cesario. "We work closely with our colleagues in cardiology, cardiac surgery and vascular surgery to provide optimal patient-oriented care."

"At the cardiovascular thoracic institute we have a unique approach to patient care that is focused on the needs of each individual patient," says Cesario. "We are attempting to break down the traditional barriers between subspecialties and have our cardiac surgeons, vascular surgeons and cardiologists work as a team to provide the optimal treatment plan for each patient we see."

For Bonnie Hawthorne, Cesario's first patient upon his arrival at USC in 2008, his dedication to individual patients was evident from the start.

"I'm dangerous with an Internet connection and came to him with a ton of questions," says Hawthorne, who was successfully treated by Cesario for atrial fibrillation. "He met every single question with good

## The Heart of the Matter

The USC Cardiovascular Thoracic Institute is housed on the USC Health Sciences campus, just three miles from downtown Los Angeles and conveniently located near the intersection of the 5 and 10 freeways.

The institute is home to a full range of state-of-the-art cardiovascular programs and services, including:

**Adult Congenital Heart Disease Program:** As more and more children born with congenital heart disease grow into adulthood, this program provides coordinated subspecialty care for those patients.

**Body Computing:** The institute is a recognized leader in the use of implanted wireless devices that transmit up-to-the-second physiologic data to physicians, patients and patients' loved ones.

**Robotic Surgery:** Institute physicians and scientists conduct clinical and bench research to advance the use of robotic techniques in the fields of heart and lung surgery.

For more information about services at the institute, visit [www.DoctorsofUSC.com](http://www.DoctorsofUSC.com) or call 1-866-764-CVTI (1-866-764-2884).

factual data, and was unbelievably kind and patient. He was my total hero.”

The doctors who run the heart transplant program at USC University Hospital say that patient satisfaction is central to their success. “We have a family feel to our program,” says Mark Barr, co-director of cardiothoracic transplantation and associate professor of cardiothoracic surgery at the Keck School. “We steward patients and develop relationships with them and their families before, during and after surgery.”

The USC heart transplantation program provides transplant services for patients with end-stage cardiac disease for whom other medical or surgical therapies are not advisable. Most transplant patients are otherwise healthy, are under the age of 70 and usually carry the diagnosis of cardiomyopathy or coronary disease.

Collaboration with other disciplines through the institute has streamlined the care offered by the transplant program. “Having all of the specialty clinics in close proximity facilitates referrals and care between doctors, and makes things easier for patients,” says Barr. “A patient can see me, see Dr. Cesario, see Dr. Matthews, all in one day, moving from exam room to exam room.”

**MICHELLE KEOGH**, of Oceanside, Calif., was only 26 and three months pregnant when she had a heart attack in 2006. After numerous trips to her local emergency room, she was diagnosed with endocarditis, an infection of the lining of the heart. The condition destroyed her mitral valve.

After giving birth to her daughter early, Keogh underwent multiple surgeries at a local hospital to replace the valve. Months of complications ensued before she was referred to the care of Barr and his team at USC University Hospital.

Says Keogh: “I was so scared of a heart transplant, but then Dr. Barr said: ‘You will be followed at USC for the rest of your life. The sooner we get you wearing a Trojan sweatshirt, the better!’ For a patient who had seen so many doctors, it was a relief to know that there was one person who would be with me for the long haul.” Within three months, Keogh had a successful heart transplant surgery.

“Dr. Barr and his team saw me as a whole person – a mother, a 26-year-old woman,” she says. “They thought about what I needed for my future, and how I would go on to care for my children. The other hospi-



**CELEBRATING SUCCESS** USC heart transplant patient Michelle Keogh shares the spotlight with her three children, from left, Savanna, 8, Christopher, 10, and Kaylee, 3, at a Rancho Cucamonga Quakes minor league baseball game in April 2009. Keogh threw out the first pitch to commemorate Organ Donation Awareness Month.

tals just saw me as a patient.”

Patient satisfaction like Keogh’s would not be so high if the program did not offer outstanding outcomes. In a July 2009 report, the U.S. Transplant Scientific Registry of Transplant Recipients announced that the heart transplant program at USC University Hospital has a statistically higher three-year survival rate than the national average. The report compiled risk-adjusted survival rates for the 125 heart transplant centers across the country, and USC was one of only three centers to achieve a statistically higher survival rating. This report marked the second year in a row that USC achieved a statistically higher survival rating.

“Having patient survival rates statistically higher than the national average over multiple years speaks to our consistency of quality care,” says Barr. “Any program can have a good year, or even a bad year, once in a while. But year over year? That speaks to the fact

that we are doing a lot of things right.”

Doing things right for patients is a key component to the continuing success of the institute, according to Starnes, who is also chairman of the Department of Surgery at the Keck School. “Because of our cooperative process, our patients are very satisfied and our patient volumes have grown,” he says. “We have created a user friendly environment that gets the best efforts out of our doctors and brings the best results to our patients.”

*Additional reporting by Cheryl Bruyninckx.*

*If you have questions or comments on this article, please send them to [magazines@usc.edu](mailto:magazines@usc.edu).*



**SPECIALISTS WORKING TOGETHER** Leslie Saxon, a specialist in diagnosis and treatment of arrhythmias, says heart patients at USC are reviewed by a team of medical and surgical specialists who work together to plan treatment and follow-up care.