Innovations in heart care

This newsletter is designed to inform physicians about some of the more innovative cardiac care procedures now available at the University of Chicago Hospitals and about new research and clinical interests of the heart specialists on staff here.

Areas that have recently expanded here are electrophysiology, now under the direction of Brad Knight, MD, a specialist in catheter treatment of atrial fibrillation; the chronic angina and peripheral vascular programs, led by interventional cardiologist John Lopez, MD; the heart failure program, led by Allen Anderson, MD, and new cardiac imaging techniques under the direction of Roberto Lang, MD.

In many cases, these newer procedures provide an alternative to surgery. Once the procedure is completed and the patient has recovered, follow-up care is provided by the referring physician.

To inquire about referring a patient, or for more information on any of these clinical advances, please call (773) 702-1757.
EP tools for dysynchrony, A-fib

The University of Chicago is one of a few hospitals in the country and the first in Chicago testing next-generation pacemaker devices in heart failure in the DECREASE-HF Trial.

A new approach to cardiac resynchronization therapy may help patients with bundle branch block and congestive heart failure.

The EP team is evaluating a bi-ventricular pacing defibrillator that uses a novel bi-polar coronary sinus lead. With conventional cardiac pacing, leads from a pacemaker or defibrillator are placed in the right atrium and right ventricle. Resynchronization pacing therapy is achieved by adding a lead through the coronary sinus to pace the left ventricle. Commercially available coronary sinus leads that are designed to pace the left ventricle are all unipolar.

“This device allows us to vary the timing,” said Brad Knight, MD, Director of Cardiac Electrophysiology. “It can pace just the left ventricle, both ventricles together, or one ventricle slightly before the other.” The procedure is offered only to patients who have advanced congestive heart failure, despite optimal medical therapy. “It’s an alternative in some patients to a heart transplant,” said Knight.

This procedure involves an overnight hospital stay. Patients return to have their incisions checked one week postoperatively, as with any patient receiving a pacemaker or defibrillator. The risk of major complications such as infection, pneumothorax, or coronary sinus trauma is about two percent.

Knight’s team at the University of Chicago Hospitals also has considerable experience using catheter ablation to cure patients with paroxysmal atrial fibrillation who have failed anti-arrhythmic drug therapy.

“The pulmonary veins are an important source for the initiation and maintenance of this very common arrhythmia,” said Dr. Knight.

The procedure involves a transeptal catheterization and placement of ablation catheters around the ostium of the four pulmonary veins to deliver radiofrequency current which electrically isolates the pulmonary veins from the left atrium.

“Atrial muscle sleeves extend from the left atrium one to two centimeters into the pulmonary veins,” said Dr. Knight. “These fibers are a common source for initiation and perpetuation of atrial fibrillation. If you can electrically remove them from the atrium, many patients can be cured of atrial fibrillation.”

The risks from this procedure are peripheral embolism or stroke, one to two percent, and tamponade, less than one percent. The risk of symptomatic pulmonary vein stenosis is less than 1 percent.

Patients stay overnight and recover in a few days. They take heparin and coumadin for two months.

To inquire about referring a patient or for more information please call (773) 702-5988.

New options for angina

The chronic angina program at the University of Chicago provides options for patients who have not responded to standard treatment.

Promising new treatments such as gene therapy to stimulate angiogenesis and neurostimulation to block pain are being evaluated for patients with unresponsive angina in national trials at the University of Chicago Hospitals.

“We believe we have something to offer most severe angina patients who have not been helped by angioplasty or bypass surgery, or were never even candidates for such procedures,” said John Lopez, MD, Director of Cardiac Catheterization and the Chronic Angina Program.

In the AGENT trial, researchers inject FGF-4, an angiogenic protein, into the coronary arteries to encourage growth of new blood vessels. “Preliminary studies have shown significant improvement in exercise ability,” said Lopez, “with very little or no adverse effects. Our own experience has been very encouraging, too.”

In addition, the program is implementing newer angiogenesis protocols for patients with severe peripheral vascular disease or patients threatened with loss of a leg because of vascular insufficiency.

The program is also participating in the STARTSTIM trial using pacemaker-like devices to interrupt the nerves that cause angina. Stimulation alleviates pain by interfering with nerve impulses before they reach the brain.

This work is an expansion of interventional cardiology interests at Chicago. Traditionally, the Cath Lab has been involved in testing new interventional products, including pivotal trials of drug-eluting stents, brachytherapy systems, and carotid stents. Current interventional trials include testing new devices such as distal-protection filters to attempt to prevent heart
Hope and help for heart failure

**The University of Chicago Hospitals is one of four nationally testing an experimental mechanical pump for patients with advanced heart failure.**

The transplant and congestive heart failure teams at the University of Chicago Hospitals offer patients with few options new types of therapy available only at a few academic medical centers in the United States, from experimental ventricular assist devices to multi-organ transplants.

"Ours is a multi-disciplinary team of physicians, surgeons, nurses and social workers who address the medical and surgical issues related to heart failure and the social issues that complicate treatment," said Allen S. Anderson, MD, Director of the Heart Failure and Transplant Programs for the Hospitals. "Many patients who come here for their heart failure surgery or for transplant have been turned down by other centers. Our job is to assess their medical therapy and decide what we can offer.

**A new dimension in echocardiography**

The University of Chicago Hospitals was the first center in the area and one of only three in the country to perform clinical assessment of the first real-time three-dimensional echocardiography device.

During the first 50 years of echocardiography, physicians relied on two-dimensional images of the heart that they had to juggle mentally to try to understand a patient’s problem and how to prepare for procedures. But researchers at the University of Chicago Hospitals, equipped with the latest in imaging devices from Philips Electronics, are now able to see real-time 3D images of the beating heart, a view previously available only to surgeons. Specialists here, along with colleagues at Duke and Harvard, worked with Philips engineers to develop transducers capable of taking images of the beating heart.

"With 3D echocardiography, it’s like holding the heart in your hand, being able to slice it and see any plane that you want, even the leaflets of the valves. It helps you to understand how to help the patient," said Roberto Lang, MD, Director of Cardiac Noninvasive Laboratories at the University of Chicago.

Lang’s team, which performs 12,000 echocardiograms a year, has two machines, including one in pediatrics and two more on order. The group recently added 3D color Doppler exams to its repertoire to view blood flow within the heart.

"We have had a lot of referrals of patients with complex problems for diagnostic opinions based on their three-dimensional echocardiographic images," said Lang. "We can measure parameters of function more precisely in three dimensions. The surgeons can know more about the

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New options for angina (continued)

attacks during interventional procedures, and myocardial cooling during acute myocardial infarctions.

Lopez stressed that the hospitals’ catheterization facility has recently upgraded to the latest equipment with a new GE Innova flat digital imaging system for cardiac imaging with increased image resolution and reduced radiation exposure and a Toshiba peripheral vascular interventional room.

'This equipment enables us to perform state-of-the-art hemodynamic and angiographic exams, measurements, including peripheral studies and carotid studies,’ said Lopez.

Interventional cardiology physicians are available on a 24-hour basis to handle emergency procedures and acute myocardial infarction.

For more information, contact John J. Lopez, MD, at jlopez@medicine.bsd.uchicago.edu or (773) 702-1372. A 24-hour physician-referral line is also available at (773) 702-5555.

To inquire about referring a patient or for more information please call (773) 702-1842.

The Heart Center (773) 702-1757 http://heart.uchospitals.edu/

Brad Knight, MD (773) 702-5988
John Lopez, MD (773) 702-1372
Allen Anderson, MD (773) 702-9396
Roberto Lang, MD (773) 702-1842

A new dimension in echocardiography (cont’d)

pumping ability of the heart,” he said, "and can imagine the operation they’re going to do the next day.”

Diagnosing and treating mitral valve disorders has become one major use for the new equipment. "There are times when repairing is better than replacing a valve,” said Lang. The 3D images assist in the decision-making process by showing the surgeon ahead of time what portion of the valve is not functioning properly.

3D imaging can also help with complex congenital heart disease. "The three-dimensional view makes it much easier to visualize multiple anomalies, comprehend the complexity of the disease and then determine how to repair it,” Lang said.

3D will quickly replace 2D imaging, he adds. "In the next two to three years," he predicts, "this will be the standard way in which an echocardiogram will be performed.

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