Innovative electrophysiology procedures used to treat cardiac arrhythmias

UCLA's Cardiac Arrhythmia Center offers adult and pediatric patients the most advanced procedures for diagnosing and treating cardiac arrhythmias. The Center works closely with cardiologists in the Ahmanson-UCLA Cardiomyopathy Center, UCLA Cardiac Surgery Program, and the Ahmanson-UCLA Adult Congenital Heart Disease Program. The Center’s specialized team includes electrophysiologists (cardiologists who have additional training in the diagnosis and treatment of abnormal heart rhythms) as well as cardiologists, surgeons, radiologists and anesthesiologists.

Cardiac arrhythmias – disturbances in the normal, regular rhythm of the heart – tend to produce symptoms of palpitations, fatigue and shortness of breath. In many cases, arrhythmias are benign and no medical treatment is needed. However, some people can develop serious consequences if arrhythmias are left untreated. New cardiac electrophysiology interventions, including ablation and the use of implanted devices, have greatly increased treatment options.

Ablation therapy targets atrial fibrillation

Atrial fibrillation is an abnormal heart rhythm in the upper chambers of the heart (atria) due to disordered electrical activity that results in an irregular and often-rapid heart beat. The pattern of atrial fibrillation episodes differs in every patient, but the condition initially presents with short, self-terminating episodes (“paroxysmal”), then progresses to episodes of longer duration (“persistent”), then recurrent and eventually chronic (“permanent”).

Treatments include controlling heart rate with medication to prevent deterioration of cardiac function and restoring regular rhythm often with cardioversion (shock to the heart under anesthesia) or antiarrhythmic drugs, radiofrequency ablation or implanted devices. In addition, patients at risk for stroke take anticoagulation medications.

Outpatient ablation techniques offered through the UCLA Electrophysiology Lab for atrial fibrillation include:

**Pulmonary vein isolation/left atrial ablation:** Since atrial fibrillation signals often originate from the pulmonary veins, this technique inserts catheters via the blood vessels to the left atrium through which

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radiofrequency energy is delivered to the area of the atrium that connects to the pulmonary vein. This “disconnects” the pathway of the abnormal rhythm and prevents electrical impulses from the pulmonary vein from entering the atrium. Candidates for this procedure include patients with paroxysmal and persistent atrial fibrillation whose symptoms do not respond to medical therapy or who cannot tolerate medication.

**Catheter maze:** In this ablation procedure, radiofrequency energy replicates the lines created through the open-heart maze procedure, and thereby prevents electrical impulses from propagating in the atria. Candidates for catheter maze include patients with permanent atrial fibrillation.

**Minimally invasive epicardial ablation:** A very recent advance combines the ability to access the epicardial (outer) surface of the heart percutaneously (without open heart surgery) with ablation therapy to treat arrhythmias in areas of the heart that could previously be reached only by opening the chest surgically. The UCLA Cardiac Arrhythmia Center is the first center in the western United States to offer this outpatient procedure.

**Ventricular tachycardia ablation:** Electroanatomic mapping combined with hemodynamic support is applied in high-risk patients with ventricular tachycardia, a potentially life-threatening arrhythmia from the lower chambers of the heart (ventricles). Remarkable success and low complication rates are demonstrated in patients with bundle branch reentry, and idiopathic, monomorphic and unstable ventricular tachycardias.

Alternative ablation techniques using ultrasound, cryogenic and microwave technology are currently under investigation.

**Ablation for complex macro re-entrant tachycardias in patients with adult congenital heart disease:** One of UCLA’s three electrophysiology labs is dedicated to the placement of implanted devices, such as artificial pacemakers and defibrillators, to regulate the heart’s rhythm and monitor heart rate. Programs offered through this lab include:

- **Heart failure - bi-ventricular pacing/implantable devices** – UCLA arrhythmia specialists provide left ventricular epicardial and endocardial leads for previously unsuccessful bi-ventricular implants. Of these patients, 98 percent are treated using the endocardial (inside the heart) placement of left ventricular leads. The remaining patients can be treated using the less invasive epicardial (on the outside surface of the heart) approach. At UCLA, the success rate for both approaches is better than the national average, which is reported at 90 to 92 percent.

- **Lead extractions** – Since the number of patients with pacemakers and implanted cardiac defibrillators has rapidly increased in recent years, the need has increased for explanting cardiac devices and lead systems in cases of infection or malfunction. The UCLA Cardiac Arrhythmia Center's state-of-the-art laser system provides the most efficient and safe method to extract these devices.

**Patient referral**
To discuss or refer a patient, please call 310-206-2235.
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