



# Arrhythmia Center

Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology  
Comprehensive Assessment \* Continuity of Care \* State-of-the-Art Technology

## OVERVIEW



USC Arrhythmia Center  
Cardiac Electrophysiology  
1500 San Pablo Street  
2nd Floor  
Los Angeles, CA 90033

800-USC-CARE  
323-442-5334 (P)  
323-442-5399 (F)  
CardiacEP@usc.edu  
[www.usc.edu/CardiacEP](http://www.usc.edu/CardiacEP)

## CENTER OVERVIEW

The USC Arrhythmia Center offers comprehensive care specializing in the diagnosis, treatment and follow-up for patients with heart rhythm disorders. Our multidisciplinary approach provides detailed assessment of issues including:

- Lightheadedness and loss of consciousness
- Palpitations
- Supraventricular Arrhythmias
- Ventricular Arrhythmias
- Family history of rhythm disorders
- Sudden cardiac death risk assessment
- Electrical abnormalities relevant to congestive heart failure

We are dedicated to providing the highest quality of individualized care by our USC physicians and nurse specialists. Our goal is to provide patients with state-of-the-art treatments, including:

- Pharmacologic Therapy
- Electrophysiology Study/Catheter Ablation
- Pacemaker Placement
- Implantable Cardiac Defibrillator Placement
- Biventricular Pacing for Treatment of Congestive Heart Failure
- Comprehensive Device Follow-Up

This brochure will introduce you to the spectrum of diagnostic studies, procedures and treatments available through the USC Arrhythmia Center and USC University Hospital.

## DIAGNOSIS OF ARRHYTHMIAS

An arrhythmia is a heart rhythm abnormality related to a change in either the speed or the pattern of electrical impulses in the heart. The heart beat may be too slow, too rapid, irregular, or originate from an abnormal site in the heart. An arrhythmia may lead to symptoms including:

- Lightheadedness
- Palpitations
- Fainting spells
- Fatigue
- Chest pain
- Shortness of breath

Some patients may not have arrhythmias, but may be at future risk due to other underlying heart disorders or a family history of serious rhythm problems. There is a spectrum of severity of arrhythmias. Some arrhythmias may be life-threatening. Other arrhythmias may lead to symptoms, but are not life-threatening. One of the goals of the evaluation is to differentiate serious from benign heart rhythm disturbances.

## COMPREHENSIVE HISTORY AND PHYSICAL EXAM

Our goal is to provide comprehensive assessment of your symptoms, medical history, and physical exam findings, so that we may initiate an individualized diagnostic work-up and therapeutic plan. Potential diagnostic and therapeutic options available are described below, depending on the results of our comprehensive assessment.

# DIAGNOSTIC TESTING

## *Electrocardiogram*

The electrocardiogram (ECG) records the heart's electrical activity. Small pads called electrodes are placed on your chest, arms and legs, and are connected by wires to the ECG machine. Your heart's electrical impulses are translated into lines on a strip of moving paper, allowing doctors to determine the location, pattern, and rate of electrical impulses in the heart.

## *Holter Monitor*

The Holter monitor is a small, portable device you wear that makes a 24-hour continuous recording of electrical impulses during your normal daily activities. The device may detect arrhythmias which may not show up in an ECG. You will be asked to maintain a diary of your activities and symptoms while wearing the monitor to see if there is a correlation between symptoms and monitor findings.

## *Event Recorder*

The event recorder is a device that is useful when symptoms do not occur on a daily basis. The monitor is usually kept for a period of at least one month. The monitor allows recording of your heart rhythm during symptoms which can then be sent in via a telephone connection.

## *Exercise Stress Test*

The exercise stress (treadmill) test enables physicians to record your heart's electrical activity during exertion in a controlled setting allowing for observation for rhythm disturbances which may not occur at rest.

## *Genetic Testing*

There are certain cardiac rhythm disorders which are due to specific genetic abnormalities. In some cases, genetic testing can be performed to assess for abnormalities associated with these disorders.

## DIAGNOSTIC TESTING (continued)

### *Cardiovascular Imaging*

Non-invasive cardiovascular imaging including echocardiography, nuclear imaging studies, cardiac CT scan, and cardiovascular magnetic resonance imaging allows for detailed assessment for identification of structural heart abnormalities associated with heart rhythm issues. Cardiac MRI can provide detailed 3-Dimensional visualization of cardiovascular structure and can define specific tissue characteristics of the heart. Invasive cardiac catheterization allows for assessment of heart pressures and coronary artery abnormalities which can be associated with rhythm disturbances.

### *Electrophysiology Study*

The EP study is an invasive study which allows doctors to assess the heart's electrical system and induce arrhythmias under controlled conditions. During the study, doctors insert special catheters (long, flexible wires) into veins and guide them into the heart. These catheters sense electrical impulses and may also be used to stimulate different areas of the heart. Doctors can then locate the sites which are causing arrhythmias. This test is useful in diagnosing the mechanism and location of heart rhythm disorders, which enables decisions to be made about the most appropriate treatment method. For some arrhythmias, specialized ablation catheters can be placed at the site of the arrhythmia origin with application of heat energy to cure the arrhythmia.

## TREATMENT OPTIONS

Depending on results of diagnostic testing, your doctor will decide with you the appropriate therapeutic options. Potential options depend on the type and severity of your arrhythmia.

### *Medications*

Certain antiarrhythmic drugs change the electrical impulses in the heart and suppress abnormal sites from starting irregular or rapid heart rhythms. Some medications need to be initiated on a monitored hospital ward.

## TREATMENT OPTIONS (continued)

### *Follow-up EP Study*

In order to assess the effect of a medication on a rhythm disorder, some patients may require a follow-up EP study, performed several days after medication initiation to ensure that the abnormal heart rhythm is no longer inducible.

### *Catheter Ablation*

Catheter ablation is a curative procedure that involves the application of energy through a catheter tip to cauterize electrical tissue causing the arrhythmias. This is usually performed as a part of an electrophysiology study demonstrating an abnormality amenable to ablation. Our highly-skilled physicians have several technological methods to locate and treat the fast heart rate. Carto mapping and navigation system allows us to reconstruct a 3-Dimensional image of the cardiac chambers. This can increase precision and decrease procedures x-ray times. Radiofrequency catheters are positioned close to the abnormal electrical tissue and heat energy is passed through the tissue. The goal is to cauterize the abnormal electrical site to cure the arrhythmia.

### *Permanent Cardiac Pacemaker*

A pacemaker is used to treat very slow heart rhythms. A pulse generator is implanted beneath the skin below the collarbone; a pacing wire connects the pulse generator to the heart and carries electrical impulses. The rate of impulse formation controls the heart rate and does not allow the heart to slow below a certain rate.

### *Implantable Cardiac Defibrillator (ICD)*

For people who have had life-threatening rapid heart rhythms or are at risk for sudden cardiac death (SCD), an implantable cardiac defibrillator (ICD) delivers an electric shock to the heart when necessary. Additionally, these devices can also pace the heart for slow heart rates.

## TREATMENT OPTIONS (continued)

### *Biventricular Pacemaker or Biventricular Implantable Cardiac Defibrillator*

In addition to their other functions, these devices can be used to treat congestive heart failure (CHF) in patients with cardiomyopathy (an enlarged heart) or patients with decreased heart function with certain types of electrical abnormalities.

## OUR FACULTY AND STAFF

Leslie A. Saxon, MD  
Jerold Shinbane, MD  
Mark Cunningham, MD  
Christina Marino, BS  
Cynthia Stolicky, RN  
Susie Song, RN  
Diana Cheng, MA

## CONTACT US

If you would like to make an appointment, please call (323) 442-5100

USC Cardiac Electrophysiology  
1500 San Pablo Street  
2nd Floor  
Los Angeles, CA 90033

800-USC-CARE  
323-442-5334 (P)  
323-442-5399 (F)  
CardiacEP@usc.edu  
[www.usc.edu/CardiacEP](http://www.usc.edu/CardiacEP)