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Clinical Update
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Physician News

Electrophysiology and the Cardiac Rhythm Center

This month, the Spotlight features one facet of our cardiovascular services – electrophysiology (EP) and the Cardiac Rhythm Center. JMHPN spoke with Scott Neal, Program Manager of the Cardiac Rhythm Center, Susan Eisenberg, MD, the new medical director of Electrophysiology, and Kim Burch, Executive Director, Cardiovascular Services to learn more about some important new features of this service.

First, some background: Over the past decade, the Cardiac Rhythm Center has been carefully developed to diagnose and treat a variety of heart rhythm disorders (arrhythmias) including highly complex cases.

Cardiac electrophysiologists at John Muir Health use state-of-the-art equipment to help them perform technologically advanced, computer-assisted diagnostic electrophysiology studies. They perform catheter ablations to inactivate abnormal tissue responsible for some rhythm disturbances, as well as implant pacemakers, defibrillators and cardiac resynchronization devices.

Many of these procedures were formerly performed only at leading academic medical centers.

Having one of the most technically trained electrophysiology teams in the Bay Area and the most sophisticated equipment available today, the John Muir Health Cardiac Rhythm Center is able to treat arrhythmias such as SVT (supraventricular tachycardia), AFL (atrial flutter), VT (ventricular tachycardia) and A-fib (atrial fibrillation) with a very high rate of success.

***JMHPN:* What are some recent developments in your department - programs, initiatives, successes?**

Scott Neal: With the recent purchase of a new Cryo Ablation console, we have been able to shorten our procedure time for A-fib ablation from around 4 - 4.5 hours to approximately 2.5 - 3 hours while increasing our success rate. Shortening the procedure time decreases the time the patient is under general anesthesia, as well as decreasing X-ray exposure time for the staff and the patient, and most of all it decreases the left atrial time which lowers complication rates. The ability to do these procedures in less than three hours has also allowed for the scheduling of additional cases the same day, making our department more productive.

In June of last year, we implemented an electrophysiology course for our RNs and techs, designed to bring the entire team together to discuss cases. Learning advanced cardiac anatomy as it pertains to electrophysiology, studying different mechanisms of tachycardia and case study with review has been a way to improve our outcomes and learn more about the characteristics of each tachyarrhythmia. It has turned into something very special -- the group that comes every other Tuesday after work (on their own time) has become very close-knit, feeding off

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each other's enthusiasm and excitement, and ultimately learning more than I ever expected. It is showing in our electrophysiology procedure suite every day.

Of what are you most proud?

Scott Neal: I'm most proud of the team environment we have been able to build over the last year and the incredible dedication of the staff in learning more and more about electrophysiology and the complex procedures we do in the EP Lab.

What do you wish other MDs knew about your department?

Scott Neal: I would like them to know how much ablation procedures have changed over the past four to five years. For example, A-fib ablations no longer take six hours like in years past. Success rates on first ablations have gone up significantly and complications during procedures have gone down. Successful ablations for patient with VT and ischemic cardiomyopathy have increased as well and are also proven to help patients receive fewer shocks from their ICDs (implantable cardioverter-defibrillators.)

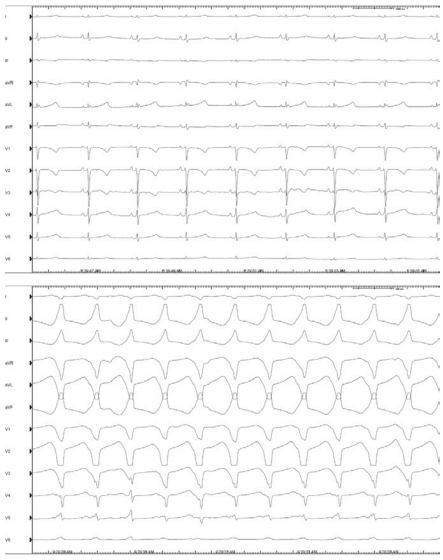
What are your goals for the next few years? What's on your wish list?

Kim Burch: Our goal is to continue to develop the Cardiac Rhythm Center and increase awareness of the services we provide to physicians and patients throughout the Bay Area. Electrophysiology is a very specialized field of cardiology and few hospitals have devoted the resources that John Muir Health has to this rapidly growing and changing field of medicine.

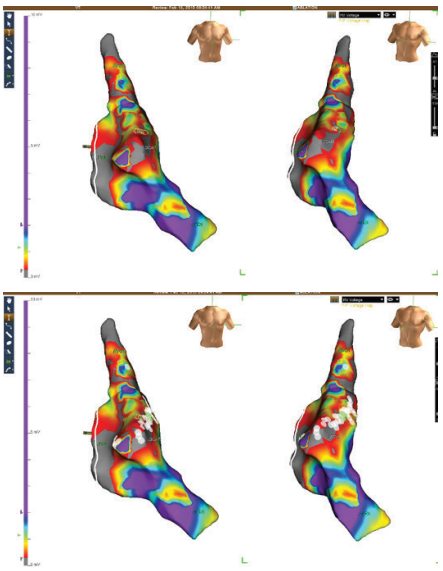
Any patient stories you'd like to share?

Dr. Eisenberg: One recent example involved a 45-year old woman who was out for a run when she noted a high heart rate. She felt quite poorly and presented to a local emergency room where she was found to be in ventricular tachycardia at a rate of 180 bpm. The rhythm terminated when she vomited. The VT was left bundle morphology suggesting a right ventricular source. An echo suggested an enlarged right ventricle and baseline ECG showed t wave inversions in the anterior precordial leads. A cardiac MRI was done and showed that the right ventricle was hypokinetic diffusely. Signal averaged ECG was abnormal in two of three criteria.

She was brought to the EP lab for a stimulation study and voltage mapping of the right ventricle. There were several areas of scar identified, and readily inducible VT. She had a defibrillator placed. At follow-up, she had many episodes of VT, not usually requiring a shock, but self terminating. Several months after the implant she was brought back for a repeat study and her VT was successfully ablated. She has felt great since. She has small children and feels much safer now with her defibrillator and successful ablation.



Top: Baseline ECG showing T wave inversions in V1 to V3; second ECG (bottom) shows ventricular tachycardia with a left bundle branch block and inferior axis suggesting an origin mid to high in the RV.



These are voltage maps of the right ventricle with the SVC on top and the IVC on the bottom. The maps are color-coded by voltage with normal healthy high voltage shown in red, and abnormal low voltage shown in red or gray (depicting scar). This patient has a large anterior patchy scar in the mid anterior wall. The top image shows white ablation marks in a line connecting two areas of scar through a low voltage isthmus. This is where the VT circled. It became non-inducible after ablation.