Rhythm that is Music to the Heart

By Sameh Fahmy

2003 marked the start of the EP program at MUSC.

J. Marcus Wharton, MD, obviously likes a challenge. As Professor and Medical Director of Electrophysiology (EP) at Medical University of South Carolina (MUSC) in Charleston, USA, about half of his referrals are from electrophysiologists who attempted to treat their patient's arrhythmias but could not. And although Wharton likes a challenge, he admits that the Siemens AXIOM® Sensis XP recording system makes treating even the most difficult arrhythmias easier. "It's really an advantage to have terrifically pure signals on the recording system," he says.

Medical Solutions sat down with Wharton, a pioneer in curative catheter ablation procedures, to discuss advances in electrophysiology and the role Siemens technology plays in treating patients at MUSC.

Tell me about the history of electrophysiology at MUSC.
WHARTON: When Dr. Michael Gold [MD, PhD] became our chief of cardiology in 2002, one of the things that he wanted to do was make this into not just a good state program, but a nationally and internationally recognized program. He recruited me in 2003, after I had been at Duke [University Medical Center] for 18 years as head of electrophysiology. Dr. Gold offered me Charleston and all this new equipment to play with, and I couldn't resist. Since I came here, our volume has grown astronomically. We perform about 800 therapeutic ablations per year, and our pacemaker and defibrillator volume is large and continues to increase by about 20 percent per year. We're pretty well capped at what we can do with the facilities that we have, so we're moving into the new hospital [in October 2007] so that we can continue to grow.

How does the Siemens technology in place at your electrophysiology lab support your high workload?
WHARTON: It supports it well [laughing], and it gets its stress test everyday. The defibrillation lab runs pretty much from 7 a.m. until 9, 10, 11, or 12 o'clock every night. And I'm booked seven or eight months in advance. Even to have half a day down is a huge difficulty. So reliability is a big issue, and the equipment is excellent in that regard.

Now let's talk specifically about pulmonal vein ablation treatment. Which patients with atrial fibrillation (AF) are selected for that procedure?
WHARTON: It used to be a very select group of patients with atrial fibrillation who were candidates – typically just patients who had paroxysmal atrial fibrillation. Then, six or seven years ago, it expanded to persistent atrial fibrillation and now includes chronic atrial fibrillation. With the evolution of the procedure, we're actually able to cure a large percentage of patients in each of those categories. The two restrictions that we have are that they have to have symptomatic atrial fibrillation and they have to have tried an anti-arrhythmic drug for six months.

What are your success rates for ablation therapy?
WHARTON: You'll read a lot of literature, and there are 'success rates,' but those include suppression of atrial fibrillation with the continuation of anti-arrhythmic drugs. The cure rate that we're talking about is getting patients off their drugs – eventually off of their blood thinners, as well – and we're running about an 85 percent cure rate for a single procedure. For chronic atrial fibrillation, we pretty much anticipate that we'll probably have to do a touch-up procedure. So an 85 percent cure for one procedure up to the

Professor J. Marcus Wharton is envisioning even more precision with *syngo* DynaCT Cardiac.

The signal quality of AXIOM Sensis XP is crucial for EP procedures.

high 90th percentile for one more procedure. With chronic atrial fibrillation, we're getting 60 percent or so cure rates in the short term.

You've been working with the EP recording systems from Siemens since March 2002. What has been your impression of the new generation?
WHARTON: Delightful. The previous system worked fine, and most of the issues were user friendliness and software issues. I'm on the EP advisory committee with Siemens and worked with them to provide feedback on the things that needed to be improved. And pretty much all of those issues have been addressed. It does virtually all the things that you need it to – record on multiple channels, record quickly, annotate, pace multiple sites – but if you were to stack it up against everybody else's system, the biggest thing is the signal quality.

How would you characterize the signal quality of the AXIOM Sensis XP system?
WHARTON: I've seen pretty much all of the recording systems that exist, and the signal quality of the Sensis system is among the best I've ever seen. That's particularly an issue as we get into more complex ablations. For example, we've had several patients referred by other electrophysiologists who have attempted to do ablations of ventricular tachycardia but didn't see anything using their equipment. We put our catheters in and they made nice clear, crisp signals. One physician said, "Where'd that come from?" [laughing]. And I said, "The difference is in the equipment you use."

How intuitive is the user interface for AXIOM Sensis XP, and how does that impact workflow?
WHARTON: The first version took a little training, but this version is much more user friendly. There are more hot keys, and it's easier for the techs to learn. If you have a fairly high turnover, which EP labs do, training the techs and the nurses can be a hassle when you have to go through multiple windows and know where all the drop-down menus are. A lot of that has been streamlined in the XP version, and that makes for a much more user-friendly interface.

The *syngo*® user interface offers the ability to stimulate 'on the fly' with the click of a button. How has that feature been useful?
WHARTON: That's very helpful. It was one of the things that we pushed for heavily because it's so difficult to go from one pacing output to a different one in terms of redirecting up and down.

Let's talk about magnetic navigation. How does the precision, speed, and remote control of the AXIOM Artis *d*FC Magnetic Navigation impact workflow during the EP procedure?
WHARTON: That's a new paradigm, particularly for ablation. But like everyone else, we're still learning how to use it and where to use it best. It's potentially capable of automating a lot of what we do from patient to patient and doing it without being exposed, at least as the operators, to radiation. So I think it has great potential. Where we use it most here is in the ablation of supraventricular tachycardia. In terms of AF ablation, unfortunately they don't quite have the catheters to be able to do that. Once we have that integrated system, you'll have the CT image, you record it in, you work within the shell of this CT image and superimpose with CARTO® mapping information, and then guide your catheter either manually or have it automatically guided by the computer.

Are there any new technologies that you're looking forward to?
WHARTON: DynaCT Cardiac is very exciting to me because I can get adequate quality CT-like images in the EP lab. The fact that it's on the table at the time that we're doing the ablation is the most exciting thing.

*The interview with Professor Wharton was held in Charleston , SC, USA, by medical writer **Sameh Fahmy**, a science and technology journalist based in Athens, GA, USA.*