

Q&A with William Sauer, MD: Chief of the Brigham's Cardiac Arrhythmia Service

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William Henry Sauer, MD, the new chief of the Cardiac Arrhythmia Service at the Brigham, discusses his vision for the department and how an expert team of electrophysiologists are providing leading-edge care for abnormal heart rhythms that affect a variety of patients, particularly those with complex medical concerns. This Q&A, which originally appeared in *Brigham On A Mission*, has been edited for length.

Q: What brought you to the Brigham? What opportunities do you see?

WS: At a major academic medical center like the Brigham, I have the opportunity to collaborate with a large, diverse faculty of arrhythmia experts and cardiovascular specialists who are delivering integrated care across multidisciplinary teams. The Cardiac Arrhythmia Service is staffed by some of the world's most experienced physicians in cardiac electrophysiology who provide individualized care, from diagnostic services, outpatient treatment, in-hospital care, post-discharge ambulatory care to preventative education.

Q: What is your broad vision for the Cardiac Arrhythmia Service?

WS: My vision is to find areas of overlap across many departments. We approach every case with a spirit of collaboration. When we work together as a group, we all grow stronger. That's why we regularly enlist the services of interventionalists and routinely interact with members of heart failure, imaging and cardiac surgery.

For instance, during lead extractions, surgeons join electrophysiologists in the operating room. Our multidisciplinary approach lead by Melanie Maytin, MD, focuses on patient safety for these challenging and sometimes higher risk cases. Also, given the overlap of electrophysiology and genetics, we regularly meet with members of the Heart and Vascular Genetics Program. Sunil Kapur, MD, closely works with this group to study the genetic basis of arrhythmias and the management of patients with inherited arrhythmia syndromes.



William Sauer and Pierre Qian, a cardiac electrophysiology fellow, work together using imaging, mapping and ablation catheters to treat atrial fibrillation in a patient debilitated by this arrhythmia.

Q: What innovative treatment approaches does the Cardiac Arrhythmia Service offer?

WS: A central mission in the field of electrophysiology is being able to safely modify abnormal cardiac tissue, and we are always trying to determine better ways to deliver energy in precise and controlled ways to ablate targeted tissue. In work led by one of our electrophysiologists, Paul Zei, MD, PhD, we are one of only a few centers in the world using radiation to precisely destroy abnormal tissue causing arrhythmias.

Additionally, we recently developed an investigational needle catheter in preclinical work and are now using it to treat patients with ventricular tachycardia who have failed available medications and standard ablation techniques. We are one of three hospitals in the United States using this investigational catheter. This work is led by Usha B. Tedrow, MD, MS, director of the Clinical Cardiac Electrophysiology Fellowship Program (CCEP).

Our program is currently using a cutting-edge electroanatomical mapping system that allows us to visualize multiple catheters without the need for fluoroscopy. This work is led by Dr. Zei, who is a world-renowned expert in fluoroscopy reduction techniques for catheter ablation of arrhythmias. This work is being done in collaboration with Thomas Michael Tadros, MD.

The noninvasive Cardiovascular Imaging Program at the Brigham uses all available imaging types, including 3D echocardiography, cardiac CT, cardiac MRI, nuclear cardiology, PET/CT, CT/MRI and ultrasound. This sophisticated cardiac imaging allows us to be more confident in our understanding of cardiac anatomy and to better visualize catheter contact in real-time.

Q: How is your department using digital technology to improve patient care?

WS: We are using several digital tools to track complications and outcomes. Bruce Koplan, MD, recently developed a database for evaluating quality improvement initiatives. He's shown that complication rates have dropped dramatically since the introduction of new technologies into our practice. We are using remote monitoring technology to help patients avoid trips to the hospital, and we can follow-up with appropriate patients using a telehealth platform.

Many of our patients can be monitored remotely with implanted devices that continuously collect information. Michael Sweeney, MD, directs our implanted device program at the Brigham and Women's Faulkner Hospital. In addition to managing a large cohort of patients with implanted devices, Dr. Sweeney is also investigating new ways to optimally program devices to improve cardiac function.

Right now, Gregory Piazza, MD, MS, a colleague in cardiovascular medicine, is using a computer algorithm to detect stroke risk in patients with atrial fibrillation. The software notifies providers when they access a patient's electronic medical record and may suggest prescribing an anticoagulant depending on the patient's stroke risk. A clinical trial presented at the 2018 American Heart Association meeting showed that this computer-assisted artificial intelligence intervention prevented strokes and saved lives, which is a major advance for computer-based decision support.

A member of our cardiac electrophysiology faculty, Amy Leigh Miller, MD, PhD, is actively involved with the development of Brigham Health's electronic medical record and investigating new ways for artificial intelligence to improve our care of arrhythmia patients.

Q: How is your program training the next generation of electrophysiologists?

WS: As an electrophysiologist, there are so many things that I do today that I never learned as a trainee. This is partly driven by the rapid pace of change and the explosion of technological innovations in our field. What we practice today is going to be different in 10 years, so we need to keep learning and embracing new technology that helps us diagnose and treat arrhythmias.

Our fellowship, directed by Dr. Tedrow, is a top program designed to train cardiologists in the most up-to-date methods and techniques in management of arrhythmias. The program routinely attracts the best and brightest fellows from across the globe.

We offer many educational opportunities to physicians who want to learn advanced techniques in electrophysiology. For example, physicians travel from all over the country to learn fluoroscopy-free catheter ablation for arrhythmias. Currently, we are building an animal laboratory for basic research in electrophysiology, where physicians will soon be able to learn cutting-edge techniques and new imaging modalities from our faculty.

Q: How would you describe the culture of your team?

WS: I think the central ethos of the Cardiac Arrhythmia Service is *clinical innovation*. We want to help patients who visit Brigham Health, of course, but we also want to help patients who don't come directly to the Brigham. We do that by conducting exciting preclinical research that we can then bring out of the laboratory and into clinical medicine.

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