Spotlight Interview

The Good Samaritan Hospital

Jeffrey L. Williams, MD, MS, FACC
Director of Electrophysiology
The Good Samaritan Hospital (GSH)
Lebanon, PA

What is the size of your EP lab facility and number of staff members? What is the mix of credentials at your lab?

The Good Samaritan Hospital's invasive cardiac electrophysiology laboratory is 800 square feet and fully-equipped to function as a cardiothoracic surgical suite. We have our own anesthesia equipment that consists of a traditional ventilation machine and full anesthesia cart (Dräger Fabius® Tiro compact anesthesia system, Draeger Medical, Inc., Telford, PA) and the Acutronic Monsoon Jet Ventilator (ACUTRONIC Medical Systems AG, Switzerland).

There are two full-time technologists (David Lugg, BS, RCIS and Douglas Hollis, RCIS) and one full-time nurse (Robert Gray, BSN, RN). In addition, we have one part-time technologist, Michelle Stoner, BS, CVT, who still participates in traditional coronary and peripheral interventional cardiology procedures.

Jeffrey L. Williams, MD, MS, FACC is the director of cardiac electrophysiology and is board-certified in internal medicine, cardiovascular disease and clinical cardiac electrophysiology. He received his B.E. in electrical and biomedical engineering and his Master of Science in bioengineering prior to earning his MD at Drexel University. He was recently joined by co-director of electrophysiology Robert Stevenson, MD, who is board-certified in internal medicine, cardiovascular disease, and nuclear cardiology. Dr. Stevenson recently completed a two-year fellowship in clinical cardiac electrophysiology at Hershey Medical Center. He received his B.S. in biology at Muhlenberg College prior to earning his MD at Drexel University.

When was the EP lab started at your institution?

After approximately two years of planning, Good Samaritan's invasive cardiac EP lab was opened on July 1, 2008.

What types of procedures are performed at your facility? Approximately how many are performed each week?

The EP lab at Good Samaritan provides comprehensive electrophysiologic care. Device implantations include pacemakers, defibrillators, biventricular defibrillators, and implantable loop recorders. Our new state-of-the-art procedure room permits diagnosis and management

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Exterior view of The Good Samaritan Hospital.

Staff in the Good Samaritan's invasive cardiac electrophysiology laboratory. From left to right: Dr. Stevenson, Dr. Williams, Robert Gray, Michelle Stoner, Douglas Hollis, and David Lugg.

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of cardiac arrhythmias, including treatment for patients with syncope, supraventricular tachycardia (or SVT; *e.g.*, AV nodal reentry, Wolff-Parkinson-White syndrome), atrial fibrillation/flutter, ventricular tachycardia (VT), and survivors of cardiac arrest. We routinely perform ablations for SVT, VT, and atrial fibrillation. In addition, we are one of only three centers in Pennsylvania that offers jet ventilation and intracardiac echocardiography (ICE) guidance for advanced ablations.

Outpatient EP Clinic Team. From left to right: Joann Bollinger, Denae Witmer, Candice Ebling, Cathy Mease, Fran Lindsey, Amy Cairns, Susan Middleton (Clinical Director), and Lonna Lackey.

What is the primary goal of your program?

The Good Samaritan's Cardiac & Vascular Center has always sought to provide the most advanced and comprehensive cardiovascular care to the residents of Lebanon Valley. The addition of a complete electrophysiology program to Good Samaritan's Cardiac & Vascular Center is really the last piece of the cardiac care puzzle in Lebanon County. This will allow area residents to receive all of the state-of-the-art care offered at big city hospitals right here in Lebanon. As the premier provider of health care in Lebanon County, Good Samaritan is proud to provide these and other state-of-the-art services to the Lebanon area.

Who manages your EP lab?

Julie Miksit is the vice president of the cardiovascular service line and Alicia Wike, RN is the cardiac cath (CCL) and EP lab supervisor of Good Samaritan. The manager of the cardiac cath and EP labs is Jennifer Hemperly, RN.

Is the EP lab separate from the cath lab? How long has this been? Are employees cross-trained?

Yes, the EP lab has been separate from the CCL since our inception in July 2008. All of the EP lab staff are cross-trained to CCL, and two RNs and one CVT are cross-trained to EP.

What new equipment, devices and/or products have been introduced at your lab lately? How has this changed the way you perform those procedures?

As a new invasive electrophysiology laboratory, we were afforded the opportunity to equip it with the most state-of-the-art equipment available. Our recording system is GE's CardioLab IT (GE Healthcare, Waukesha, WI), powered by the Centricity cardiovascular information system. This is linked to a Micropace EPS320 two-channel, computerized stimulator (Micropace EP Inc., Tustin, CA). We use Biosense Webster Inc.'s CARTO XP Navigation System for 3D electroanatomical navigation (Biosense Webster, Inc., a Johnson & Johnson company, Diamond Bar, CA). We perform all electrophysiologic ablations with anesthesia support as well as High Frequency Jet Ventilation (HFJV), which involves rapid ventilation using small tidal volumes. Relative to inhaled positive pressure ventilation, HFJV produces less cardiac motion, which facilitates catheter ablation by reducing the electrode dislodgment rate. There are only three centers in Pennsylvania that are equipped for jet ventilation in the EP laboratory.

Cardiologists Edward Tadajweski, MD and Jeffrey L. Williams, MD, MS, FACC were the first in the U.S. to perform 3D imaging of complex cardiac anatomy using GE Healthcare's Innova 3D imaging system. On February 26, 2009, they performed 3D reconstructions on two patients in the third invasive catheterization laboratory of Good Samaritan. Three-dimensional reconstructions are widely recognized as invaluable tools for evaluating CT and MRI images. The first patient underwent 3D angiography of the coronary sinus to guide a biventricular defibrillator implantation with a left ventricular pacemaker lead. The second patient underwent 3D angiography of the left atrium and pulmonary veins to

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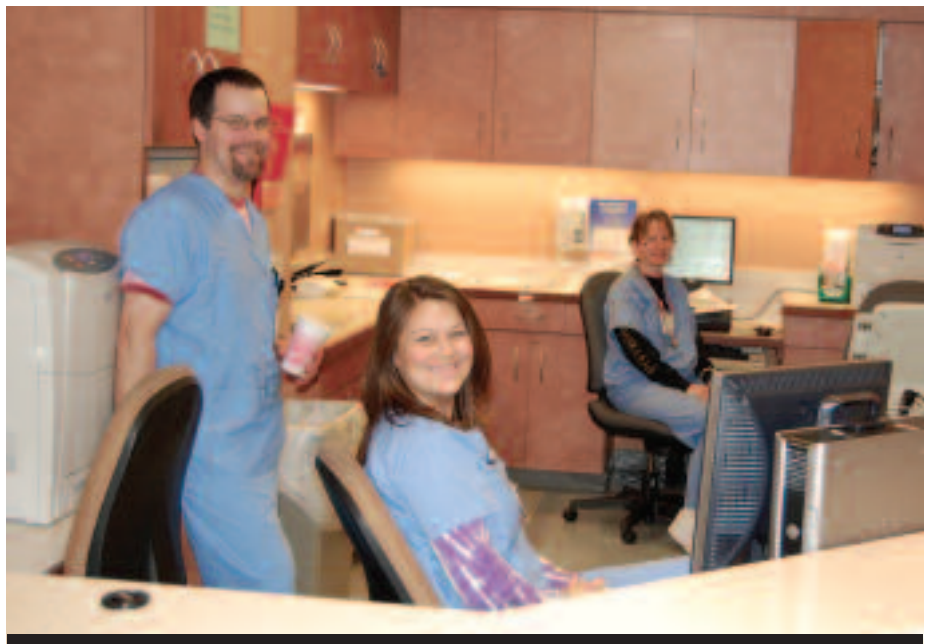
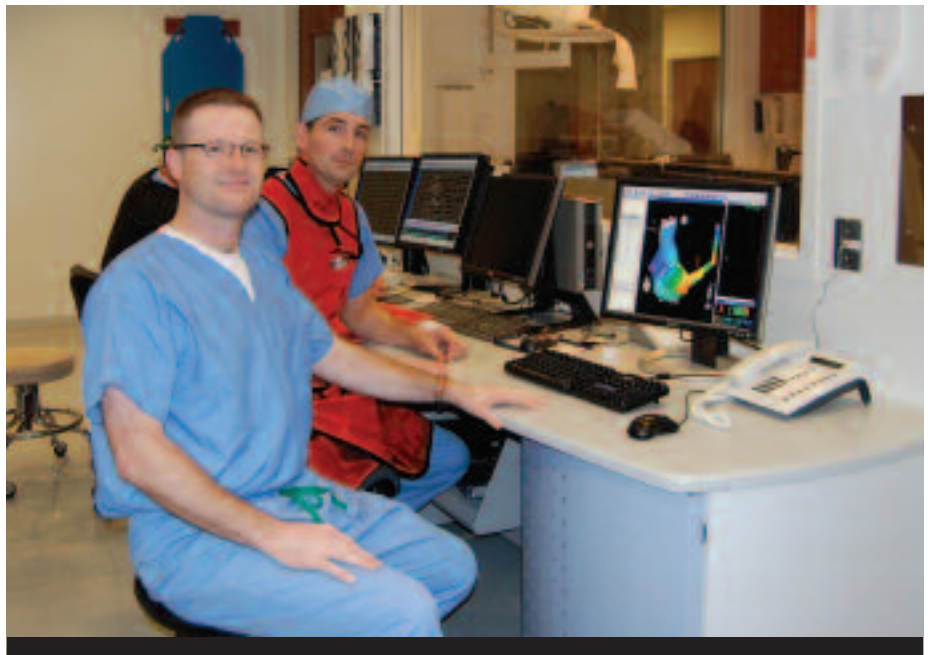


EP Lab Front Desk with Recovery Nurses and Scheduler. From left to right: Dwight Landis, RN, Shelby Koch, and Sheryl Lutz-Snyder, RN.



Drs. Williams and Stevenson during an EP study. We will often do more difficult ablations when both physicians are available to maximize procedural success.

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plan an atrial fibrillation ablation. Both patients ultimately underwent successful procedures that were enabled by the advanced 3D imaging. The Good Samaritan Hospital is currently the only center in Pennsylvania to offer this technology in the cardiac catheterization laboratory. This helps the physician determine both the optimal course of patient therapy and proper implementation of the chosen course of action. Good Samaritan and Lebanon Cardiology Associates continually strive to stay ahead of the curve in treating heart rhythm disorders.

EP Lab Anesthesia Setup with Jet Ventilator and Full Anesthesia Cart. Pictured is James Pohronezny, CRNA.

Who handles your procedure scheduling? Do you use particular software?

We have an administrator/scheduler who handles the day-to-day procedure scheduling for inpatients and outpatients.

What type of quality control/quality assurance measures are practiced in your EP lab?

We pride ourselves on providing the highest quality cardiac care in our region and feel the only way to ensure that is an objective analysis of our outcomes. In April 2010, Dr. Williams will be presenting the results for our first 250 consecutive device implants at the 7th Annual World Health Care Congress; we will be the first center in Pennsylvania and the first community center in the U.S. to present these results. He reported outcomes and complication rates on all patients having device implants in our lab. Data collected (from implant to six weeks post-implant) included baseline demographics, complications, readmission rates, fluoroscopy time and contrast usage. This community cohort had similar ejection fractions but were older with worse kidney function than those studied in prior published reports. There was one major early complication (0.4%) and seven minor early complications (2.8%). LV lead placement was successful in 64/66 patients (97%). This first report of the initial 250 consecutive patients in a non-academic, community hospital EP program revealed an elderly, ill population with rates of major complications lower than prior reported national trials and academic centers. Contrary to current perceptions, these data suggest that Good Samaritan may subselect an elderly, ill patient population, and that we provide high quality, cost-effective, and more accessible care to our patients.

How is inventory managed at your EP lab? Who handles the purchasing of equipment and supplies?

The inventory is managed by the supervisor of the labs, with input from the EP staff. Utilization of products is studied to set appropriate par levels. The cardiovascular services manager collaborates with the supervisor and physicians to discuss the purchase of equipment and supplies.

Has your EP lab recently expanded in size and patient volume, or will it be in the near future?

The quality of care we provide has led to continued growth of procedural volume and referrals.

Have you developed a referral base?

Good Samaritan has a great relationship with Lebanon Cardiology Associates, PC (LCA). The Good Samaritan Hospital has been the premier hospital in Lebanon County since 1889. The LCA cardiologists have been providers of cardiac care in Lebanon County for over 20 years. Together they offer their patients innovative and state-of-the-art treatment, including cardiac imaging, interventional cardiology, electrophysiology, peripheral vascular disease, and heart failure. Both GSH and LCA are only 14 miles from Hershey, centrally located between Lancaster and Reading. In addition, they are located less than five minutes from the Lebanon VA Medical Center.

How are new employees oriented and trained at your facility?

Employees are oriented with an appropriate staff member for three months, with routine evaluations of competency. Orientation is extended as needed.

What types of continuing education opportunities are provided to staff members?

The Good Samaritan Hospital has a new continuing education system called CE Direct, and we also utilize our vendors for in-services when appropriate.

How is staff competency evaluated?

Competency is evaluated through Good Samaritan's educational services department. Competencies are done throughout the year and documented.

How do you handle vendor visits to your department? Do you contract with vendors?

Our vendors sign in upon arrival and wear badges. We frown upon any unscheduled visits, as we feel this is disruptive to our workflow and patient care.

Describe a particularly memorable or bizarre case that has come through your EP lab. What lessons did you learn from it?

Dr. Williams recently evaluated a patient with a persistent left superior vena cava (LSVC) who several years earlier had undergone a right-sided, epicardially placed pacemaker at a nearby academic center. This patient subsequently developed a severe cardiomyopathy and needed a defibrillator implantation. We were able to safely implant a percutaneous left-sided, dual-chamber defibrillator through the persistent LSVC. Recently, we placed our second defibrillator via a left persistent SVC. We are proud to offer our patients services that have historically been only offered at urban, quaternary care centers…our customer satisfaction surveys indicate that our patients are just as pleased!

Though we are a community hospital, our patient mix is no different than that of a large tertiary care center, and this is borne out of analyzing our one-year data regarding age, ejection fractions, and creatinine.

How does your lab handle call time for staff members?

The EP lab staff does not take interventional call.

Does your lab use a third party for reprocessing?

We use Ascent Healthcare Solutions for reprocessing to save on catheter costs.

Approximately what percentage of your ablation procedures are

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done with cryo? What percentage is done with radiofrequency?

We do not offer cryoablation.

Do you perform only adult EP procedures or do you also do pediatric cases? Is there cross training for pediatric cases?

We are credentialed to perform only adult (aged >18 years) EP procedures.

Do your nurses/techs participate in the follow up of pacemakers and ICDs? If so, how many device visits per week do they handle? Do you use any particular software for follow up?

All device implants are followed at Lebanon Cardiology Associates' outpatient office, which is located about five minutes from the hospital. LCA handles approximately 50-60 device patient visits per week and over 50 transtelephonic monitors per week. LCA uses the Paceart® system (Medtronic, Minneapolis, MN), LATITUDE (Boston Scientific, Natick, MA), and the Medtronic CareLink® Network.

What are some of the dominant trends you see emerging in the practice of electrophysiology? How is your lab preparing for these future changes?

There is evidence of an impending shortage of general cardiologists that will peak in 2038, reaching only 46.5% (n=33,409 fewer cardiologists) of the projected need. This is the result of factors that include declining numbers of U.S. medical graduates and those matching in internal medicine residencies, as well as patients having increasingly complex cardiovascular disease that requires the care of multiple, distinct cardiovascular specialists.[1] As such, all subspecialists will be doing an increasing amount of general cardiology, which will obviously limit time in the laboratory. In addition, the cost-intensive nature of electrophysiology will be under intense scrutiny during the current healthcare debate.

Community hospitals represent more than 85% of all U.S. registered hospitals and are responsible for more than 95% of total hospital admissions. The majority of hospitals delivering care to poor and underserved patients are community centers; however, the majority of clinical research is performed in the academic setting. To narrow this disconnect, the NIH Roadmap recognizes the vital role community hospitals must play in the translation of basic research to clinical care. Academic centers have higher care delivery costs than community hospitals due to differences in the intensity with which similar patients are treated, rather than quality of care or graduate medical education per se.[2]

Despite the substantial role community hospitals have in U.S. healthcare delivery and are likely to have in the translation of basic science to clinical care, the academic center continues to be the focus of debate. The impending physician shortage over the next several decades will strain community hospitals' workforces. Rather than trying to increase GME funding to large training programs, we suggest that ways to create and expand community hospital EP training programs should be explored.

What are your thoughts about non-EPs implanting ICDs? Do you train such individuals?

There is substantial evidence that EP implanters have fewer complications during ICD implants. Both Drs. Williams and Stevenson feel that EP specialists are more than just implanters. Patient selection and long-term follow-up are just as important as implant safety. They do not train non-EPs to implant defibrillators.

What about device recalls? How has your lab handled these?

Thankfully, we were not dramatically affected by device recalls in the first year of operation, but will generally follow the Heart Rhythm Society's and device manufacturer guidelines in addressing recalls.

Is your EP lab currently involved in any clinical research studies or special projects? Which ones?

We were part of the PACE-MI Trial, but unfortunately, this study was terminated. Drs. Stevenson's and Williams' breadth of clinical and experimental electrophysiology experience is highlighted by clinical research awards from both the American College of Cardiology Foundation and the National Institutes of Health. We are trying to develop a research program at this time, and feel that the community hospital is uniquely poised to offer substantial research opportunity over the next several decades.

Are you ACGME-approved for EP training? What do you think about two-year EP programs?

We are not an ACGME-approved EP training site. Drs. Williams and Stevenson both completed three-year general cardiology and second-year EP fellowships; however, they are concerned that this duration of training may be excessive, especially in the face of the general cardiology workforce shortage. The 8th Working Group of the 35th Bethesda Conference suggested a means to allow a five-year short track to train general cardiologists and thereby increase the potential number of practicing cardiologists. The trainee would complete two years of general internal medicine, then three years of cardiology; however, the conference did not discuss the possibility of fast-tracking for interventional or EP fellowships for those who have already completed a three-year internal medicine residency. In this model, fast-tracking would comprise of two years of a general cardiology fellowship, then two years of either interventional or EP training. This training paradigm would help increase the numbers of general cardiologists and also enable a dedicated two-year training in electrophysiology.

Give an example of a difficult problem or challenge your lab has faced. How it was addressed?

One of the most challenging aspects of starting a new electrophysiology program was preparing to perform atrial fibrillation ablations in a methodical, safe, and stepwise fashion. Atrial fibrillation ablation is one of the most complex and risky procedures performed in our laboratory. In addition, it showcases most of the state-of-the-art capabilities of our laboratory. Important elements we had to develop as part of our atrial fibrillation ablation program included: 1) Three-dimensional cardiac angiography prior to each procedure, from which multi-dimensional left atrial images were generated for each patient; 2) Close coordination with our cardiac anesthesiologists (Drs. Paul Teiken and Stephen Longo) to perform general anesthesia using jet ventilation, which maximized spatial precision during mapping and ablation; and 3) Intra-cardiac navigation involving collaboration between intra-LA echocardiography (Ultra ICE, Boston Scientific) and magnetic tracking (CARTO, Biosense Webster, Inc.). Radial ICE permitted direct, real-time visualization of the endocardial surfaces of both pulmonary antra, contiguous atrial and extra-atrial anatomy, and the location of a mapping/ablation electrode *in situ*. In addition, the double transeptal punctures required for our atrial fibrillation ablation paradigm are guided by ICE.

The means by which we accomplished each of these elements is in no small thanks to the long-term, close working relationship of Good Samaritan and the physicians of Lebanon Cardiology Associates and Lebanon Anesthesiology Associates.

Describe your city or general regional area. How does it differ from the rest of the U.S.?

Lebanon County is a predominantly rural area (surrounding the city of Lebanon) with a very hardworking population. These patients are very proud and loyal. We consider caring for these patients a privilege and carries a unique responsibility. By offering our patients the most state-of-the-art electrophysiologic care, we have the responsibility that most larger centers do not: that is, if the patient has a complication or untoward outcome, there is no center or remote physician that we "send" them back to for recovery and follow-up; rather, we continue to provide their care for decades. In addition, most of our physicians and nurses live in the community, and it's common to run into patients and families on a day-to-day basis.

Please tell our readers what you consider unique or innovative about your EP lab and staff.

The Good Samaritan Hospital's invasive electrophysiology laboratory in Lebanon, Pennsylvania, offers the most state-of-the-art cardiovascular care in a patient- and family-centered atmosphere. Our EP procedures run the gamut, from pacemaker implantation to intracardiac echocardiographic-guided atrial fibrillation ablations using high-frequency jet ventilation, once only available in Pittsburgh or Philadelphia.

For more information, please visit:
www.gshleb.org/ or
www.lebanoncardiology.com

References

1. Williams JL. Projecting the general cardiology workforce shortage. *Am Heart Hosp J* 2007; 5:203-209.
2. Williams JL. Comparisons of safety-net and non–safety-net hospitals. *JAMA* 2008;300(14): 1651-1652.