

Fall 2016

# Better Medicine

Lehigh Valley Health Network

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# Three Top Benefits of Lean Practice Workflows

By Jose Santiago-Rivera, MD

*About the author: [Jose Santiago-Rivera, MD](#), is a physician at [LVPG Internal Medicine—1255 Cedar Crest](#).*

It's been nearly a year since we implemented "lean" workflow principles in our practice, and we've seen significant improvements. We now manage care through "teamlets," which pairs a provider (a physician or physician assistant) with a "flow manager" (a medical assistant or nurse), who share a common workspace or "flow station." Flow managers organize the provider's day to prioritize time, eliminate inefficiencies and make sure patients get the most value out of their visits.

## New care model

Here are three benefits we've realized from this new model of care:

- **Better teamwork:** Communication is clear, fast and continuous. The teamlets start each morning with a clinical huddle to go through the day's schedule, and they move through the day as a unit, with the flow manager ensuring that every moment of the provider's time is well spent.
- **More efficient completion of paperwork:** Flow managers make sure that patient forms are mostly filled in before the provider receives them and directs the paperwork to where it needs to go. We now have many fewer incidences of lost or duplicated forms, and less time is spent on paperwork overall.
- **Stronger patient relationships:** To give patients more quality time with their providers, we've stepped up our pre-visit planning. Flow managers will call patients about a week before their appointments to go over their goals for the visit and remind them of any tests that need to be completed before they come in. Patients know who their regular provider's medical assistant or nurse is, and they appreciate being able to interact with the same team.



[Jose Santiago-Rivera, MD](#)  
Internal medicine

## A committed team

Our transition to this care model was not without its challenges. For example, it took some trial and error to

determine the best location for the flow stations to offer privacy as well as easy communication with the rest of the office. But our entire team was committed to making this work, and we're happy to say we are a better, stronger practice as a result.

*LVPG Internal Medicine—1255 Cedar Crest practice director Ceil Sherman and clinical coordinator Nicole Pietrobon contributed to this article.*

**To learn more about Patient-Centered Medical Homes at LVHN, call 888-402-LVHN.**

*Fall 2016*





## New Hematology Oncology Center Opens in Lehighton

Patients in Carbon County who need chemotherapy and other infusion services have access to a new, cutting-edge oncology center, [LVPG Hematology Oncology–Lehighton](#), located at 363 N. First St. in Lehighton. “The new facility (which opened in September) demonstrates our commitment to the Carbon community and our passion for delivering high-quality care to our patients,” says [Dan Popescu, MD](#), a board-certified hematologist oncologist with Lehigh Valley Health Network (LVHN).

Compared to the former infusion facility at 800 Mahoning St. in Lehighton, where providers had been serving patients in the Lehigh Valley and Palmerton areas for more than 30 years, the new cancer center “is a bigger facility that’s designed to put the care and comfort of our patients first,” says Mary Greenberg, director, LVPG Hematology Oncology.

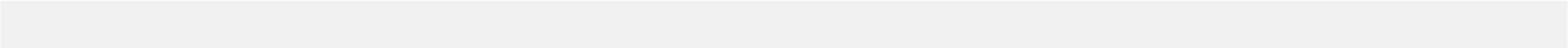
The new center features the latest in infusion equipment, six exam rooms, eight treatment chairs, an infusion pharmacy, a private infusion room and a private parking lot for improved patient access. There also will be an expanded physician presence. Patients will have access to a specialist five days per week, including Dan

Popescu, MD, [Basil Ahmed, MD](#), and [Surendra Shah, MD](#). Shah opened the first hematology oncology office in the Lehigh Valley more than three decades ago.

Patients who received services at the Mahoning Street facility will be automatically transferred to the new location and new patients are always welcome. “We’re the same providers, nurses and office staff that patients are used to, but in a more convenient location with state-of-the-art facilities,” Popescu says.

**To refer a patient for hematology oncology services, call 610-402-CARE.**

*Fall 2016*





# Health Center at Mountain Top Offers New Services

To make quality health care more convenient for patients of the Mountain Top area, Lehigh Valley Health Network (LVHN) Health Center at Mountain Top is growing. The premier outpatient facility, which opened in March 2016, recently added oncology, obstetrics and occupational health to its roster of health services so that patients can access quality care close to home or work.

## **Multiple services under one roof**

The Health Center at Mountain Top now provides:

- **Primary care** from LVPG Family Medicine providers [Mark Radzewicz, DO](#), and [Laura Herbener, CRNP](#).
- **Oncology services**, featuring LVPG Hematology Oncology providers [Michael Evans, MD](#) and [Harvey Hotchner, MD](#).
- **Cardiology services**. The facility offers adult and pediatric electrocardiograms and Holter and event monitoring, as well as stress tests and echocardiograms for adults under the direction of LVPG Cardiology

provider [Yaqoob Mohyuddin, MD](#).

- **Obstetrics and gynecological care** featuring LVPG Obstetrics and Gynecology provider [Jill Snyder, DO](#), and LVPG gynecology provider [Mary Ellen Lyons, PA-C](#).

## **Rehabilitation, imaging and lab work**

The Health Center at Mountain Top also provides rehabilitative physical and occupational therapy, occupational health treatment, imaging services including adult and pediatric diagnostic X-rays and diagnostic, vascular and obstetric ultrasounds, laboratory/blood work and telehealth services in conjunction with [Lehigh Valley Hospital–Hazleton](#).

Located at 237 S. Mountain Blvd., Suite 7, in Mountain Top, the Health Center at Mountain Top is just 14 miles north of the [LVHN Cancer Center–Hazleton](#) on Route 309.

**To learn more about the Health Center at Mountain Top, call 610-402-CARE.**

*Fall 2016*



# LVHN Clinical Trial Shows Sequential Immunotherapy Improves Outcomes

## Study results published in Lancet Oncology

A clinical trial conducted at Lehigh Valley Health Network (LVHN) and eight other academic medical centers in the U.S. demonstrates that sequential administration of immune checkpoint inhibitors benefits patients with advanced melanoma.<sup>1</sup> The study results, published in the July issue of Lancet Oncology, are part of a growing body of evidence supporting the use of checkpoint inhibitors as frontline therapies in oncology.

## New oncology pathway

The phase 2 trial, which enrolled 140 patients with unresectable stage III or IV melanoma, found that twice as many patients (41 percent) responded to administration of nivolumab (Opdivo®) followed by ipilimumab (Yervoy®) as compared to the reverse sequence (20 percent).<sup>1</sup> Disease progression at 13 and 26 weeks was significantly improved with nivolumab followed by ipilimumab (38 percent vs. 61 percent, 38 percent vs. 60 percent), as was 12-month overall survival (76 percent vs. 54 percent). Nivolumab and ipilimumab are anti-PD-1 and anti-CTLA-4 drugs that enhance the immune system's response to tumor cells.



Suresh Nair, MD

Hematology oncology

[Watch a video to learn more about him.](#)

“This trial was a major breakthrough,” says hematologist oncologist [Suresh Nair, MD](#), with [LVPG Hematology Oncology–1240 Cedar Crest](#), medical director of the LVHN Cancer Institute and an author of Lancet Oncology article. “At the start of the trial, 90 percent of patients with stage IV melanoma were dying within a year. Today, these medications are FDA-approved for combined use, and the melanoma survival rate has nearly doubled.”

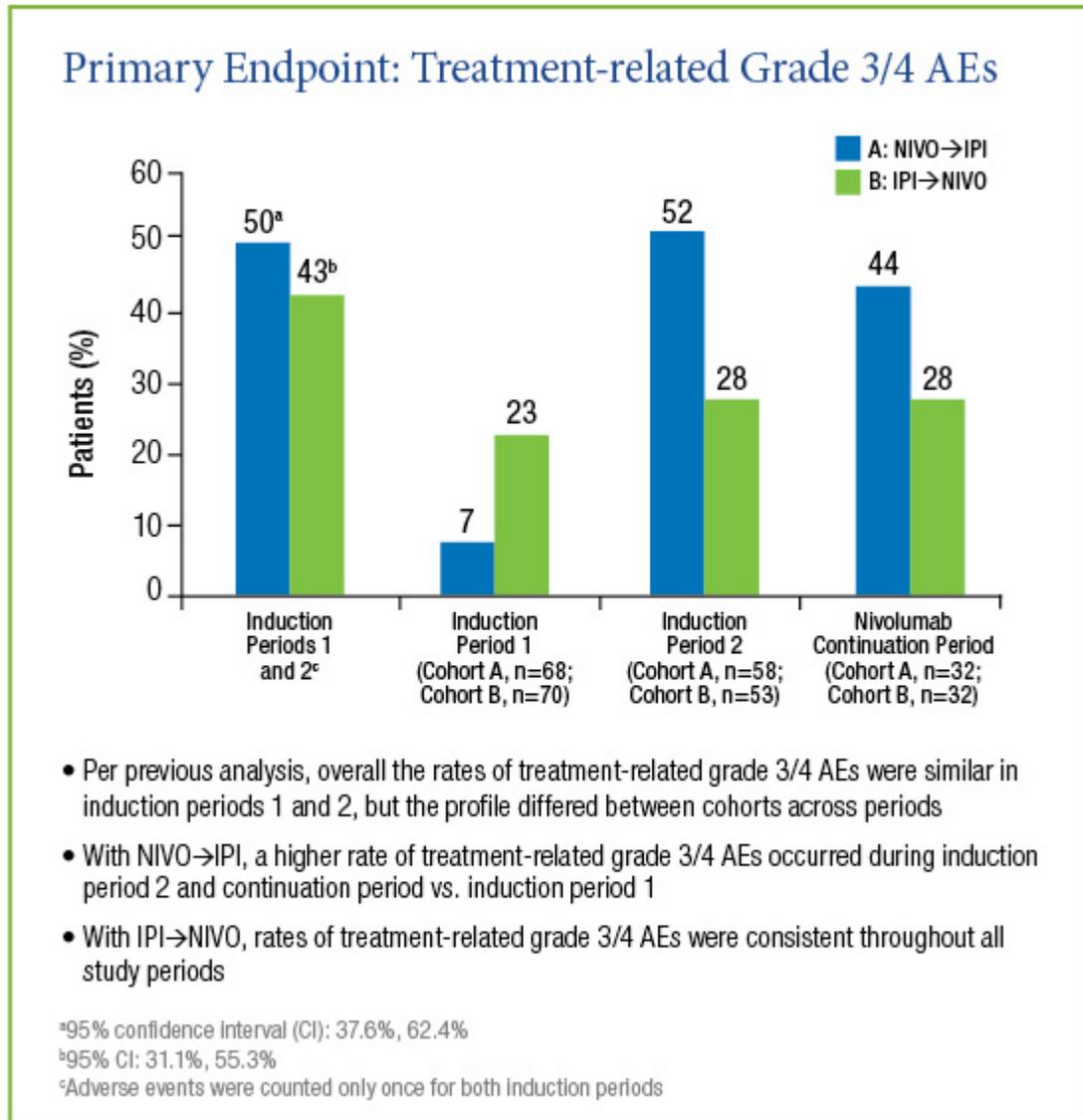
Prior to the start of the clinical trial in 2013, LVHN patient Richard Dey’s stage IV melanoma diagnosis meant that he likely had only months to live. Treatment with nivolumab and ipilimumab resulted in Nair declaring him cancer free within six months, and the checkpoint inhibitor therapy was discontinued in 2015.

“We have more than 20 patients with similar success stories at LVHN,” Nair says. “For a cancer researcher like

me, these are exhilarating times. Coming to work each day at LVHN is an adventure because we're discovering new ways to treat many types of cancer through clinical trials."

## Oncology research

The checkpoint inhibitor trial is one of dozens of clinical trials conducted at LVHN, and that number will continue to increase with LVHN Cancer Institute's membership in the Memorial Sloan Kettering (MSK) Cancer Alliance. In addition to providing access to key MSK clinical trials, the alliance includes adoption of MSK standards for oncology care and clinical collaboration among oncologists at both institutions. LVHN and MSK also share educational resources by collecting and tracking data on quality of care, outcomes and patient satisfaction.



1. "Sequential administration of nivolumab and ipilimumab with a planned switch in patients with advanced melanoma (CheckMate 064): an open-label, randomized, phase 2 trial." J. Weber et al. *Lancet Onc.* 2016; 17(7): 943-955.

To refer a patient for a clinical trial, call 610-402-CARE.



## Promoting Cutting-Edge Lung Cancer Care

Most cancer centers strive to use the latest evidence-based standards of care to guide diagnosis and treatment. But how many have put in place a formal infrastructure to make sure that's the case?

Lehigh Valley Health Network's (LVHN) disease management teams (DMTs) continually evaluate and implement the latest evidence-based clinical pathways for virtually every cancer disease site.

And LVHN specialists don't just review standards internally. They validate them with internationally renowned experts at Memorial Sloan Kettering (MSK) Cancer Center as part of the [MSK Cancer Alliance](#).

This process benefits patients with any cancer type but is particularly important for thoracic and pulmonary cancers.

"So much has changed in lung cancer therapies, especially over the last five years" says Megan Derr, MSN, RN, oncology quality and evidence-based practice specialist. "Traditionally, when new information comes out of larger academic institutions, it can take years to reach community settings. Unless you have a setting like this, with all

the key players at the table reviewing standards together on an ongoing basis, it's very hard to make change. We have a framework that allows us to continually make treatment easier, more efficient and higher quality for our patients.”

## Raising the bar

The thoracic and pulmonary disease DMT includes many of the same specialists as LVHN's lung cancer multidisciplinary clinic (MDC). But where MDCs focus on coordinating treatment for individual patients, the DMT evaluates the program overall. It includes every specialty involved in thoracic and pulmonary cancer – medical oncology, surgical oncology, thoracic surgery, radiation oncology, pulmonary medicine, diagnostic radiology, pathology and others.

“It's very important that all of the disciplines involved, both diagnostic and therapeutic, are working together to shape our program,” says [Eliot Friedman, MD](#), who leads the DMT. “It's the only way to ensure that we are giving the most effective, efficient and targeted care to our patients without wastage, that we're keeping up with the latest standards and that we're all on the same page on improving our care for lung cancer.”

The thoracic and pulmonary disease DMT analyzes 59 metrics across LVHN's lung cancer practices. And the process is ongoing – the team members meet monthly, as well as discuss care standards with their counterparts at MSK on a regular basis.

“We look at everything from imaging and surgical resection to how frequently we're giving radiation, to issues of follow-up treatment and support for survivors,” Derr says. “We also discuss clinical trials –what's accruing, if there are any difficulties, if there are new opportunities coming from MSK or pharmaceutical companies. We look at the total spectrum.”

## Diagnosis and staging

These reviews also extend to diagnosis and staging.

“As an interventional pulmonologist, my role on the team is to review how we're getting a diagnosis,



[Eliot L. Friedman, MD](#)  
Hematology-Medical Oncology



[Robert J. Krukltis, MD, PhD](#)  
Pulmonary/Critical Care Medicine

before oncologists or surgeons ever get involved,” says [Robert Kruklytis, MD](#), chief of pulmonary medicine and director of interventional pulmonary medicine at LVHN. “How do we obtain biopsies? What is the safest, simplest and most effective way to get the information we need? People might not think of pulmonologists as essential members of a lung cancer team, but it’s one of our strengths at LVHN that we build very comprehensive teams with representatives from all of the different specialties.”

One example of the effects of the DMT process: all prospective lung cancer patients at LVHN now undergo mediastinum staging early in the diagnostic process to provide the most accurate staging possible.

### **Ongoing review and validation**

One of the more unique aspects of the DMTs is that LVHN validates its standards of care against MSK, one of the leading cancer centers in the world.

“When we began this process, we had very high concordance with the standards that MSK had set for itself, and I’m very proud that our lung cancer program closely mirrors what patients would get there,” Friedman says.

That relationship is ongoing. LVHN specialists continue to collaborate with their counterparts at MSK to review changing standards, discuss difficult cases and, when necessary, obtain second opinions. The DMT also evaluates and integrates new information coming out from national organizations such as the National Comprehensive Cancer Network (NCCN) and the American Society of Clinical Oncology (ASCO).

“When our treatment team members return from national meetings, all new practice-changing information is shared and discussed at the DMT meetings,” Derr says. “We also continually evaluate our standards against new NCCN evidence blocks as they’re released. Things change so rapidly, it’s essential to have this ongoing review of our program and processes to make sure we’re providing the best care to patients.”

The end result: Whenever patients with lung and thoracic cancers come to LVHN, they can be confident that they’re getting the very latest, state-of-the-art, evidence-based care.

“This type of ongoing review of standards with independent third-party validation is extremely rare,” Friedman says. “I don’t believe it’s happening anywhere else.”

**To refer a patient for cancer care, call 610-402-CARE.**

*Fall 2016*



*Infusion catheter and ultrasonic core*

# Ultrasound-Accelerated Thrombolysis for Massive/Submassive PE

## **EKOS technology provides nonsurgical option for high-risk patients**

A new type of catheter-based intervention that uses ultrasound to promote clot fragmentation and better penetration of thrombolytic therapy is being adopted by more hospitals to provide less invasive treatment options for patients with massive or submassive pulmonary emboli (PE). “Ultrasound-accelerated thrombolysis is a potentially noteworthy new option for massive/submassive PE patients who are not candidates for surgical embolectomy,” says James Burke, MD, PhD, Lehigh Valley Health Network (LVHN) interventional cardiologist and associate

chief, division of cardiology.

Most patients with PE are treated with anticoagulant therapy (i.e., a form of heparin, or fondaparinux).<sup>1</sup> Options for managing the small minority (~5 percent) of patients with massive PE (i.e., systolic blood pressure [SBP] <90 mm Hg) include thrombolytic therapy (i.e., alteplase), catheter-based interventions, and surgical embolectomy.<sup>2,3</sup> Patients with submassive PE (SBP ≥90 mm Hg and either right ventricular dysfunction myocardial necrosis) also may be candidates for these interventions. Catheter-based modalities include clot aspiration and fragmentation as well as delivery of a thrombolytic agent directly to the clot.<sup>1</sup>

### Ultrasonic catheter

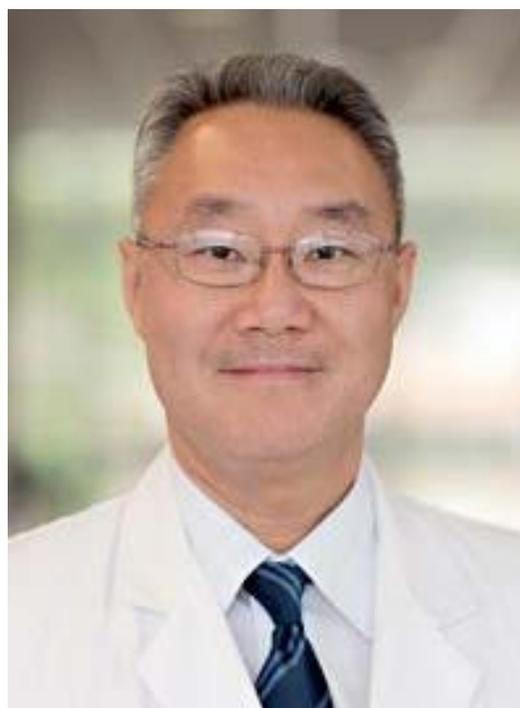
One new ultrasonic device, the EkoSonic® Endovascular System (EKOS) includes wires with ultrasonic catheters. A cardiologist or radiologist inserts the catheters and wires into the left and right femoral veins, through the heart and left and right pulmonary arteries. Ultrasound is then transmitted through the catheter. The ultrasonic catheters and wires remain in the patient, delivering lytic therapy for 12 to 24 hours. The patient is then returned to the catheterization lab to have the ultrasonic catheter removed.

Because this technology serves a narrow niche of high-risk patients (Burke estimates there are only about 1,000 cases nationally each year of this type of PE), data supporting this intervention are sparse, Burke says. Most publications report single-center series or cases, Burke says.<sup>4,5</sup> “People were looking for something to help when really nothing else helps. That’s how this (technology) came into being,” he says.

A retrospective single-center series reported 95 percent survival to discharge (57/60) and 93 percent (56/60)



James Burke, MD, PhD  
Cardiology



James Wu, MD  
Cardiac surgery

[Watch a video to learn more about him.](#)

survival at 90-day follow-up, with complete (>90 percent) thrombus clearance in 57 percent and near-complete (50 to 90 percent) clearance in 41 percent of patients following ultrasonic accelerated thrombolysis and infusion of lytic therapy for a mean of 19.6 hours.<sup>4</sup>

## Choosing the best therapy

Patients who are candidates for catheter-based interventions or surgery often have multiple risk factors and comorbid conditions, Burke says. Surgical embolectomy opens the artery faster, says James Wu, MD, chief, section of cardiac surgery. But “surgery carries its own risks,” Burke says. “Each patient is somewhat different, and it requires a multidisciplinary team to come up with the best therapy.”

“With these new technologies, we know that one specialty cannot handle the entire spectrum of care,” Wu says. “A lot of our programs are multispecialty.”

At LVHN, that team includes representation from pulmonary/critical care, cardiology, cardiac surgery, and interventional cardiology or interventional radiology. Current guidelines also recommend interdisciplinary consultation when choosing the most appropriate intervention for each patient.<sup>1</sup> Among the parameters evaluated are clot size and location, immediate clinical condition, risk for bleeding and the patient’s ability to withstand the risk of surgery, Burke says.

LVHN plans to make EKOS ultrasound-accelerated thrombolysis available in early 2017. Burke estimates that LVHN will see only three to five candidates per year for this intervention. Although that is a small number, “we felt that it was worth having, because it would be lifesaving for those who needed it,” Burke says.

Hospitals that currently utilize EKOS include Massachusetts General and other hospitals with advanced programs in treating PE.

1. Jaff MR, McMurtry MS, Archer SL, et al. Management of Massive and Submassive Pulmonary Embolism, Iliofemoral Deep Vein Thrombosis, and Chronic Thromboembolic Pulmonary Hypertension: A Scientific Statement From the American Heart Association. *Circulation*.2011;123(16):1788-1830.
2. Lapner ST, Kearon C. Diagnosis and management of pulmonary embolism. *BMJ*.2013;346:f757.
3. Ouellette DR. Pulmonary Embolism. Updated January 30, 2015; <http://emedicine.medscape.com/article/300901-overview#showall>. Accessed May 26, 2015.
4. Kennedy RJ, Kenney HH, Dunfee BL. Thrombus resolution and hemodynamic recovery using ultrasound-accelerated thrombolysis in acute pulmonary embolism. *J. Vasc. Interv. Radiol*.2013;24(6):841-848.
5. Shah KJ, Scileppi RM, Franz RW. Treatment of pulmonary embolism using ultrasound-accelerated thrombolysis directly into pulmonary arteries. *Vasc. Endovascular Surg*.2011;45(6):541-548.

**To refer a patient for cardiac evaluation, call 610-402-CARE**

# A New Name for LVPG Orthopedics

As of Jan. 1, 2017, LVPG Orthopedics was renamed [LVPG Orthopedics and Sports Medicine](#) to better reflect the variety of services and treatment options offered by the practice.

LVPG Orthopedics and Sports Medicine offers the full spectrum of orthopedic care for children through adults. All physicians are certified by the American Board of Orthopedic Surgery and have sub-specialty expertise in hip and knee joint replacement, sports medicine, orthopedic trauma, pediatric orthopedics, foot and ankle, and chiropractic care.

## **The four practice locations include:**

### [LVPG Orthopedics and Sports Medicine—1250 Cedar Crest](#)

1250 S. Cedar Crest Blvd., Allentown, PA 18103

### [LVPG Orthopedics and Sports Medicine—Muhlenberg](#)

2649 Schoenersville Road, Suite 201, Bethlehem, PA 18017

### [LVPG Orthopedics and Sports Medicine—Moselem Springs](#)

Routes 222 and 662, Fleetwood, PA 19522

### [LVPG Orthopedics and Sports Medicine—Health & Wellness Center \(Hazleton\)](#)

50 Moisey Drive, Hazle Township, PA 18202



# Orthopedic Surgeon Returns to the Lehigh Valley

## Emphasis on sports medicine, including ACL reconstruction

An anterior cruciate ligament (ACL) injury is a season-ender for most high school and college athletes.

But with timely diagnosis and treatment, roughly 80 percent of them will be able to return to their previous level of play within six to 12 months. [Gabe Lewullis, MD](#), a sports medicine orthopedic surgeon, recently joined LVPG Orthopedics to help sports participants in the Lehigh Valley with ACL and other injuries safely get back on the field as soon as possible.



Gabriel Lewullis, MD  
Orthopedic Surgery

## Hometown Hero

Lewullis, a former assistant team physician for the Boston Celtics and clinical staff physician at Harvard University Health Services and Tufts University School of Medicine, grew up in Allentown, where he was a basketball star at Allentown Central Catholic High School. “I wanted to get the chance to give back to the community that gave me so much,” Lewullis says.

As a 6-foot, 6-inch college freshman, Lewullis went down in sports history when he led the Princeton University Tigers to victory over the defending national champion, UCLA, in the opening round of the 1996 NCAA Tournament by scoring a layup with 3.9 seconds left. After Princeton, Lewullis completed his medical training at Drexel University College of Medicine and an orthopedic sports medicine fellowship at New England Baptist Hospital.

He comes to Lehigh Valley Health Network (LVHN) from Bayhealth Medical Center in Dover, Del., where he was the team physician for multiple high schools and colleges in the area, including Delaware State University and Wesley College.

## ACL Repair

At LVHN, Lewullis will serve the general orthopedic population, with an emphasis on sports medicine, including ACL reconstruction. An ACL tear is a common noncontact injury among football, basketball and soccer players that involves a pivot-shift mechanism. Symptoms often include sharp pain around the lateral aspect of the knee and acute effusion (fluid which is often blood in the knee joint).

“Patients will also often describe a pop that occurs at the time of injury,” Lewullis says.

An X-ray and MRI are used to confirm diagnosis, rule out fracture and evaluate the degree of ligament, meniscus and cartilage involvement.

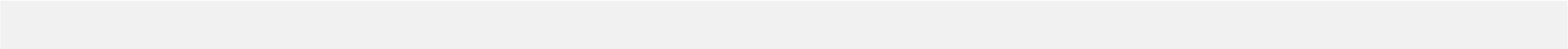
If surgery is indicated, Lewullis will reconstruct the ACL with hamstring tendon or bone patella bone autograft or allograft. “Currently, we don’t repair a torn ACL,” Lewullis says. “We replace it.” The arthroscopic, minimally invasive, same-day procedure typically takes an hour in the OR. Patients begin physical therapy the next day and

continue for three to five months, including home exercises to optimize recovery and outcome.

Restoring knee stability is the ultimate name of the game. “For the majority of athletes, it typically takes a year of playing before they feel confident going out and doing what they did prior to the injury,” Lewullis says.

**To refer a patient for sports medicine treatment, call 888-402-LVHN.**

*Fall 2016*



# New Staff Member Expands Capabilities of LVPG Urology

## Fellowship-trained urologist specializes in complex cases for female patients

The arrival of urologist [Maria Voznesensky, MD](#), with [LVPG Urology–1250 Cedar Crest](#) at Lehigh Valley Health Network (LVHN) brings expertise in the subspecialty of female urology and genitourinary reconstruction. The number of female urologists such as Voznesensky is increasing, but represents only eight to 12 percent of urologists in the United States despite the fact that female urological patients are growing in number and prefer to be treated by female urologists.<sup>1</sup>

### Pelvic floor disorders

Voznesensky specializes in the complete management of female pelvic floor disorders. Damage to the pelvic floor can be caused by childbirth, chronic disease, surgery or repeated heavy lifting. Common pelvic floor disorders include issues related to urinary incontinence, retention, frequency, nocturia and infection.

In addition, Voznesensky, who completed a fellowship in female urology and genito-urinary reconstruction at the University of Iowa, treats female patients for more complicated urinary incontinence (UI) issues such as fistula and prolapse. “Dr. Voznesensky expands our ability to meet the health needs of women and make a difference in the community,” says urologic surgeon [Angelo Baccala, MD](#), chief, division of urology, Lehigh Valley Health Network (LVHN). “Her fellowship means that complex cases can be treated here in an expert, comprehensive manner.”

Comprehensive management includes preventive,



[Maria Voznesensky, MD](#)  
Urology



Angelo Baccala Jr., MD  
Urology

diagnostic, therapeutic and surgical procedures necessary for the total care of female patients with these conditions, complications and sequelae resulting from pelvic floor disorders. Although urologic conditions impact women of all ages, a growing number of women are seeking treatment from urologists due to incontinence associated with aging.<sup>1</sup> Baccala expects that approximately 80 percent of Voznesensky's caseload will be female.

Voznesensky's other practice areas include male incontinence, urethral stricture disease, sexual dysfunction and general urology. She is experienced in both robotic and open urologic surgery. "It's important to find the best solution for the individual patient, and Dr. Voznesensky will further our efforts to personalize care," Baccala says.

1. "The gender divide: The impact of surgeon gender on surgical practice patterns in urology." D. Oberlin et al. J Urol. 2016; epub available at [jurology.com/article/S0022-5347\(16\)30386-X/abstract](http://jurology.com/article/S0022-5347(16)30386-X/abstract).

**To refer a patient for urologic treatment, call 610-402-CARE.**



# Children's Hospital Provides Neonatal Surgery for Intestinal Disease

## **Hirschsprung's disease requires frequent, ongoing monitoring**

Hirschsprung's disease is a disorder that occurs one in 5,000 live births. Timely diagnosis and surgical treatment are necessary to decrease morbidity and mortality.<sup>1</sup> Surgery for this intestinal condition is available at Lehigh Valley Children's Hospital.

### **Etiology, symptoms**

The disease occurs when nerve cells normally present in the intestine do not form properly during fetal development. Hirschsprung's may occur spontaneously or be inherited, with 20 percent of cases occurring in multiple members of the same



Marybeth Browne, MD  
Pediatric surgery

family.<sup>1</sup> Defined by the region where nerve cells are missing, approximately 80 percent of people diagnosed with Hirschsprung's have short-segment disease that affects the last segment, or rectosigmoid region, of the large intestine.<sup>1</sup> Long-segment disease is more severe in that nerve cells are lacking in most of the large intestine.<sup>1</sup> Surgery is required for all Hirschsprung's cases.

"Hirschsprung's can be deadly if there's a delay in treatment, and this is a long-term condition that clinicians work closely with families to manage," says Marybeth Browne, MD, surgical director of Lehigh Valley Children's Hospital.

Symptoms of long-segment disease typically emerge during the first few weeks of life, while chronic progressive constipation in short-segment disease may not present for months or years.

Hirschsprung's symptoms may include absence of bowel movement during first 48 hours of life, progressive abdominal distention, gradual onset of bilious vomiting and fever. Children who do not have early symptoms may present with constipation that becomes worse over time, loss of appetite, delayed growth and passing of small, watery stools.

### **Surgical treatment at Children's Hospital**

Green vomit and abdominal distention were warning signs that prompted the transfer of an infant male born in May 2015 at Lehigh Valley Hospital to the neonatal intensive care unit.

Following diagnosis of long-segment disease, Browne performed a laparoscopic diverting colostomy. The baby then underwent a laparoscopic-assisted transanal Swenson pull-through approximately three months later. Browne saw the baby every two-four weeks after his surgeries, and moved to three-month intervals once whole milk was introduced. She will continue to monitor him every six months between ages 2-5, and annually until adulthood.

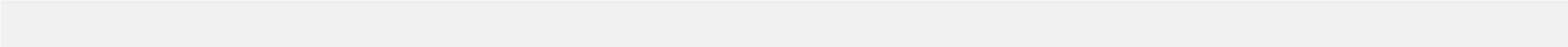
"He's doing very well, and is meeting all of his milestones despite the two surgeries," Browne says. "Offering this surgery at Children's Hospital is so important for the families of children with Hirschsprung's because of the need for frequent checkups. Driving to Philadelphia or another location would be a major burden."

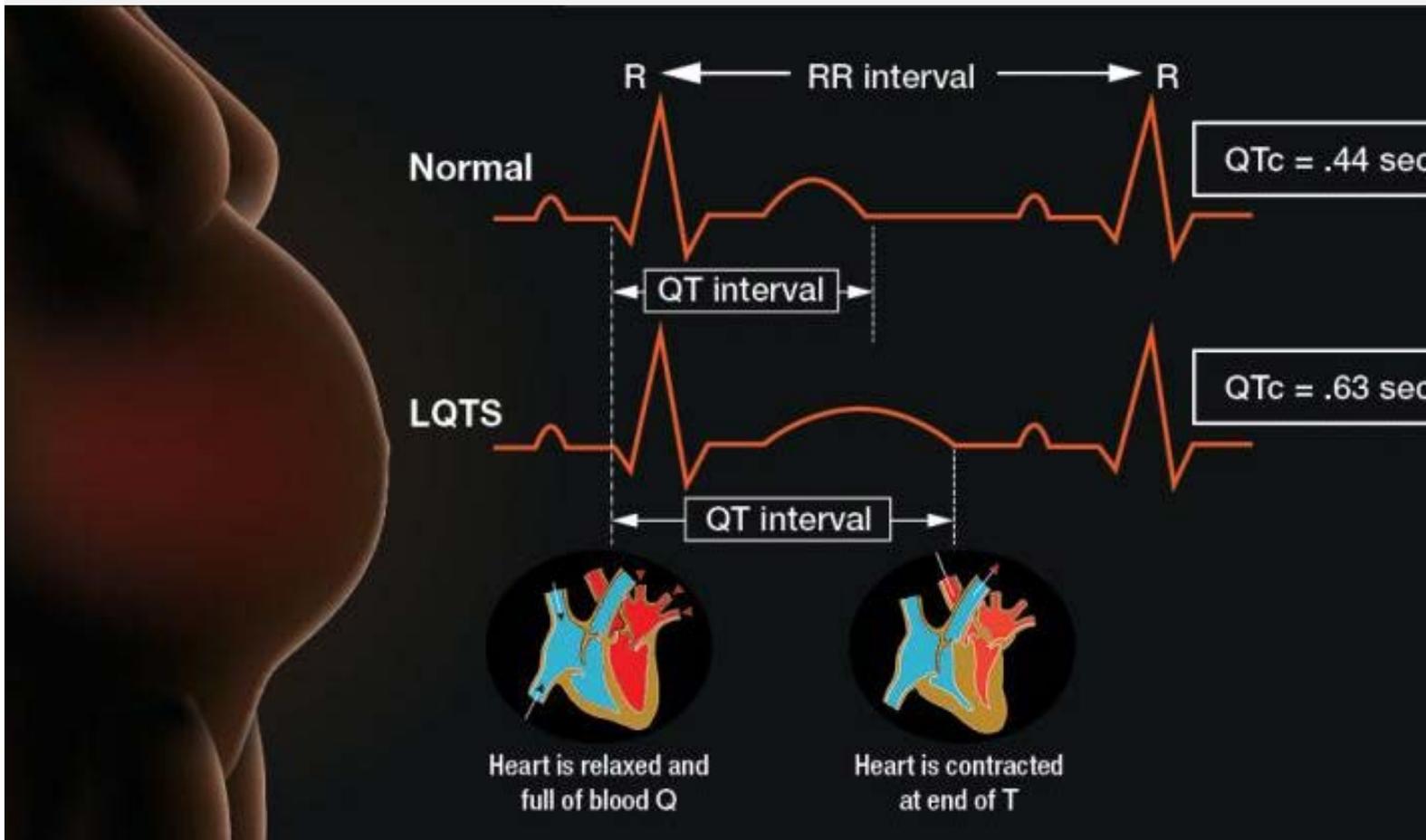
1. "Hirschsprung disease." NIH U.S. National Library of Medicine website.

[ghr.nlm.nih.gov/condition/hirschsprung-disease](http://ghr.nlm.nih.gov/condition/hirschsprung-disease).

**To refer a patient to Children's Hospital, call 610-402-CARE.**

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# Successful Collaboration in Maternal Fetal Medicine, Cardiology, OB/GYN

## Heart and Pregnancy Program provides high-risk care for patient with long QT syndrome

Careful medical management of patients with Long QT Syndrome (LQTS), a cardiac electrical activity disorder, is necessary to reduce the risk of malignant arrhythmia.<sup>1</sup> A multidisciplinary team of specialists at the Lehigh Valley Health Network (LVHN) Heart and Pregnancy Program (HPP) recently developed a successful pre-, peri- and postoperative management plan for a long QT patient in her second pregnancy.

### High-risk pregnancies

More women with congenital or acquired cardiac

disease are reaching reproductive age and achieving pregnancy, requiring complex care that addresses both cardiovascular and maternal-fetal health.<sup>2</sup> HPP is the largest program of its kind in Pennsylvania, and LVHN's group of high-risk pregnancy specialists is one of the largest in the country.<sup>3</sup> HPP was established in 2010 as part of LVHN's Heart and Vascular Program for Women, which provides specialized care and prevention of heart disease in women at all stages of life.

LVHN's comprehensive team approach includes maternal fetal medicine (MFM) specialist [Joanne Quiñones, MD](#), and cardiologist [Amy Ahnert, MD](#), with LVPG Cardiology. "A multidisciplinary approach allows for improved communication among team members caring for the patient, offering the opportunity to plan ahead for case scenarios which may occur unexpectedly," Quiñones says. "This allows for questions to be addressed before the patient comes for delivery and everyone can be more comfortable with a case that is more complicated than most."

### **Long QT case**

Brittane Gibson was a mother of one child when she was clinically diagnosed with long QT syndrome in October 2013 after experiencing a cardiac arrest. Genetic testing for the condition was negative. Gibson was managed on a hypothermia protocol, followed by placement of an automatic implantable cardioverter defibrillator (AICD). She was also started on nadolol, a beta blocker medication.

On Christmas Eve 2015, at 10 weeks gestation in



[Joanne Quiñones, MD](#)  
Maternal fetal medicine



[Amy Ahnert, MD](#)  
Cardiology

her second pregnancy, Gibson experienced sudden syncope while doing dishes. ICD interrogation showed sinus tachycardia 150 beats per minute prior to syncope, then polymorphic ventricular tachycardia. At the time, her device effectively terminated the arrhythmia.

Ahnert and Quiñones assumed Gibson's care following that event, working closely with obstetrics. The patient's medication dose was increased, and she was monitored closely at LVHN's Heart and Pregnancy Program for the remainder of the pregnancy. A multidisciplinary plan was developed

by members of cardiology, MFM, anesthesia, labor and delivery, and cardiac nursing to plan for the intrapartum and postpartum care of this patient, considering her needs for telemetry, medication compliance and medication alerts given her history of long QT syndrome and risk of malignant arrhythmia.



**Kristin Friel, MD**  
Obstetrics and gynecology

## **Clinical relationships**

"Multidisciplinary meetings are held every month to review specific cases and draw up care plans that are well-documented and clear," says [Kristin Friel, MD, LVPG Obstetrics and Gynecology—1245 Cedar Crest](#). "By nurturing these clinical relationships, we're able to provide the level of care that these complex cases demand."

Gibson's prenatal course was otherwise unremarkable and she underwent a planned repeat cesarean delivery at 39 weeks. Gibson, 29, delivered a healthy baby girl, who weighed 5 pounds, 10.8 ounces (2575 g), on July 14, 2016.

## **Counseling and assessment**

Women with known cardiac disease or risk factors ideally should receive evaluation and counseling prior to conception or early in pregnancy.<sup>4</sup> While early diagnosis and counseling are important, a majority of women referred to the HPP, including Gibson, are pregnant. The LVHN team has experience treating pregnant patients with conditions such as congenital heart block, prosthetic heart valves, bicuspid aortic valves, hypertrophic cardiomyopathy, Marfan syndrome and inherited arrhythmias such as catecholaminergic polymorphic ventricular tachycardia and long QT syndrome and, among others.

Using personal and family health history, imaging and other assessments, the multidisciplinary team identifies and quantifies risks to mother and fetus. Cardiac and obstetric issues such as medication exposure, mode of delivery and postpartum care are evaluated and assessed concurrently.

## **Simulation training**

Labor and delivery increases cardiac output, making it potentially the most dangerous period for pregnant women with cardiac disease. The HPP care team conducts simulations to prepare for deliveries by women with cardiac disease. Taught by cardiology fellows, the simulations include residents, MFM specialists, nursing staff from the labor and delivery unit and progressive care unit (PCU), anesthesiology and other providers. Simulation related to anesthesiological management is essential for long QT patients such as Gibson. Despite use of beta blockers, patients with long QT syndrome undergoing surgical or anesthetic procedures are increased risk of perioperative arrhythmias.<sup>1</sup>

## **Long QT case postpartum**

Ahnert evaluated Gibson 10 days postpartum, and referred her back to the LVHN cardiologist responsible for her care before her second pregnancy. “She’s done quite well, but physical and emotional stress during pregnancy and postpartum increase the risk of a cardiac event,” Ahnert says. “Sleep deprivation and changing hormones are aggravating factors so it’s important to have a good social support system and regular post-partum care.”

1. “Drugs to be avoided in patients with long QT syndrome: Focus on the anaesthesiological management.” G. Fazio et al. *World J Cardiol.* 2013; 5(4): 87-93. 2.
2. “Management of cardiovascular diseases during pregnancy.” V. Regitz-Zagrosek et al. *Curr Probl Cardiol.* 2014; 39(4-5): 85-151.
3. “High-risk pregnancy care.” Lehigh Valley Health Network website. Available at [www.lvhn.org/conditions\\_treatments/womens\\_health/pregnancy/learn\\_about\\_pregnancy/high\\_risk\\_pregnancy\\_care](http://www.lvhn.org/conditions_treatments/womens_health/pregnancy/learn_about_pregnancy/high_risk_pregnancy_care).
4. “Management of hypertension before, during, and after pregnancy.” P.R. James et al. *Heart.* 2004; 90(12), 1499-504.

**To refer a patient to the Heart and Pregnancy Program, call 610-402-CARE.**

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