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Better Medicine

Lehigh Valley Health Network

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Building Patient-Centered Medical Homes

By Eric Gertner, MD, MPH

About the author: Eric Gertner, MD, MPH, is a primary care physician at LVPG Internal Medicine and the medical director of Patient-Centered Medical Home and Practice Transformation for Lehigh Valley Health Network (LVHN).

As primary care physicians, many of us feel our profession has suffered a slow erosion under the pressures of paperwork and other administrative and managerial tasks. At LVHN, we've been exploring the potential for the patient-centered medical home (PCMH) concept to restore some of the tenets we hold dear.

A PCMH is both a place and a state of mind. It's a primary care office where patients receive comprehensive, coordinated care for all their health needs. It also encompasses the long-standing personal relationship and trust between patients and physicians.



Eric J. Gertner, MD, MPH
Internal medicine

A team effort

Establishing a medical home starts with realizing that a physician can't do everything on his or her own. It involves delegating responsibility and ensuring all staff members are working at the top of their skill set. One example: If a patient with diabetes is scheduled for an appointment, a nurse can proactively consult the medical record to see if that patient has received the recommended pneumococcal vaccine and administer the immunization at the beginning of the visit, instead of waiting for the physician to notice and request it.

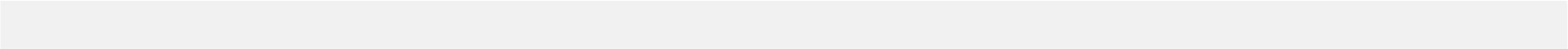
Multiply this simple process by many patients, and we begin to see better adherence to evidence-based guidelines and a healthier patient population overall.

A total transformation

At LVHN, we've been implementing medical home concepts for nearly 10 years using National Committee for Quality Assurance (NCQA) standards. Our latest effort is a pilot project with 12 LVHN primary care practices. With the help of practice coaches, project managers, organizational development consultants and experts in "lean"

workflow principles, we're making lasting, sustainable changes in the culture of these practices, helping them to become medical homes in spirit as well as on paper. We look forward to applying the lessons we learn from this pilot project throughout LVHN.

To learn more about patient-centered medical homes at LVHN, call 888-402-LVHN.





The multidisciplinary clinic allows everyone involved in GI oncology to discuss a case face-to-face, ask and answer questions, and reach a consensus on the best course of treatment.

Collaboration is Critical for Gastrointestinal Cancers

New MDC unites all modalities to deliver better, faster treatment

Experience and expertise can make all the difference in successful outcomes. But when it comes to aggressive cancers, therapies get complicated very quickly. A variety of specialists are involved, including surgical oncologists, medical oncologists, radiation oncologists and others. Historically, bringing all of that expertise together to formulate a treatment plan was a complex process that could take weeks, creating an extra burden for patients and potentially delaying needed care.

For these reasons, leading oncology centers advocate the use of multidisciplinary clinics (MDCs). Lehigh Valley Health Network (LVHN) has long offered MDCs for breast, prostate, lung and thoracic cancers, and more recently, melanoma. Now, LVHN brings this state-of-the-art approach to gastrointestinal (GI) malignancies.

Creating optimal care plans

The MDC allows everyone involved in GI oncology to discuss a case face-to-face, ask and answer questions, and reach a consensus on the best course of treatment. “Everyone involved in the patient’s care – surgeon, radiation oncologist, medical oncologist, radiologist, pathologist, nursing staff – sits around one table,” says LVHN hematologist oncologist [Maged Khalil, MD](#). “We gain a clear understanding of the biology and state of the patient’s disease, hear everyone’s opinions and formulate one plan.”

“Patients have concerns that their doctors don’t talk to each other, and unfortunately, this is often true,” says LVHN hematologist oncologist [Usman Shah, MD](#). “It’s easy for each one of us to offer our best opinion in isolation, but that may not always be best for the patient.”

The MDC addresses this problem head on. It allows us to talk in real time and look at everything as a whole, instead of in bits and pieces.”

This close collaboration is especially important for aggressive GI malignancies, such as esophageal and pancreatobiliary cancers, which by nature require multiple modalities.



Maged Khalil, MD
Hematology oncology

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



Usman Shah, MD
Hematology oncology

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

“It’s critical to determine the optimal sequence to give the patient the best chance of having the right surgery at the right time,” Shah says. “Should we do chemotherapy? Chemo in combination with radiation? Should it come before or after surgery? At many institutions, a surgeon may elect to go straight to surgery, where if he had been able to discuss it in a group setting, he may have reached a different decision.”

Expediting care

MDCs also accelerate treatment. In a typical setting, patients see each specialist one at a time, over multiple visits. As oncologists compare notes and make phone calls to discuss treatment options, the process can stretch over many weeks and sometimes months.

“As soon as patients receive a cancer diagnosis, they want to start treatment yesterday,” says LVHN radiation oncologist [Alyson McIntosh, MD](#). “Here, they see specialists in all modalities at the same time, as well as dietitians, social workers, financial counselors and others consolidated into a single visit. We can start coordinated treatment sooner, before symptoms are extreme.”

Coordinating all of those areas is a major task in itself. LVHN oncology nurse navigators like Jeanne Kenna, RN, OCN, CRNI, play a critical role in keeping all the pieces working together. They serve as the primary point of communication among all providers and the patient, as well as supportive services. They schedule all appointments, coordinate follow-up care and fill all the gaps to ensure the treatment plan is followed and that all of the patient’s needs are met.

Making an MDC work

Most oncologists recognize the value of MDCs, but



[Alyson McIntosh, MD](#)
Radiation oncology



Jeanne Kenna, RN, OCN, CRNI
Cancer support services

it takes a unique institution to support one. It requires a close-knit team that fully embraces the collaborative MDC approach and can work together in harmony. The institution must be committed to multidisciplinary cancer care, and provide the space and resources to make it possible. Above all, an MDC requires specialists with extensive experience managing GI malignancies.



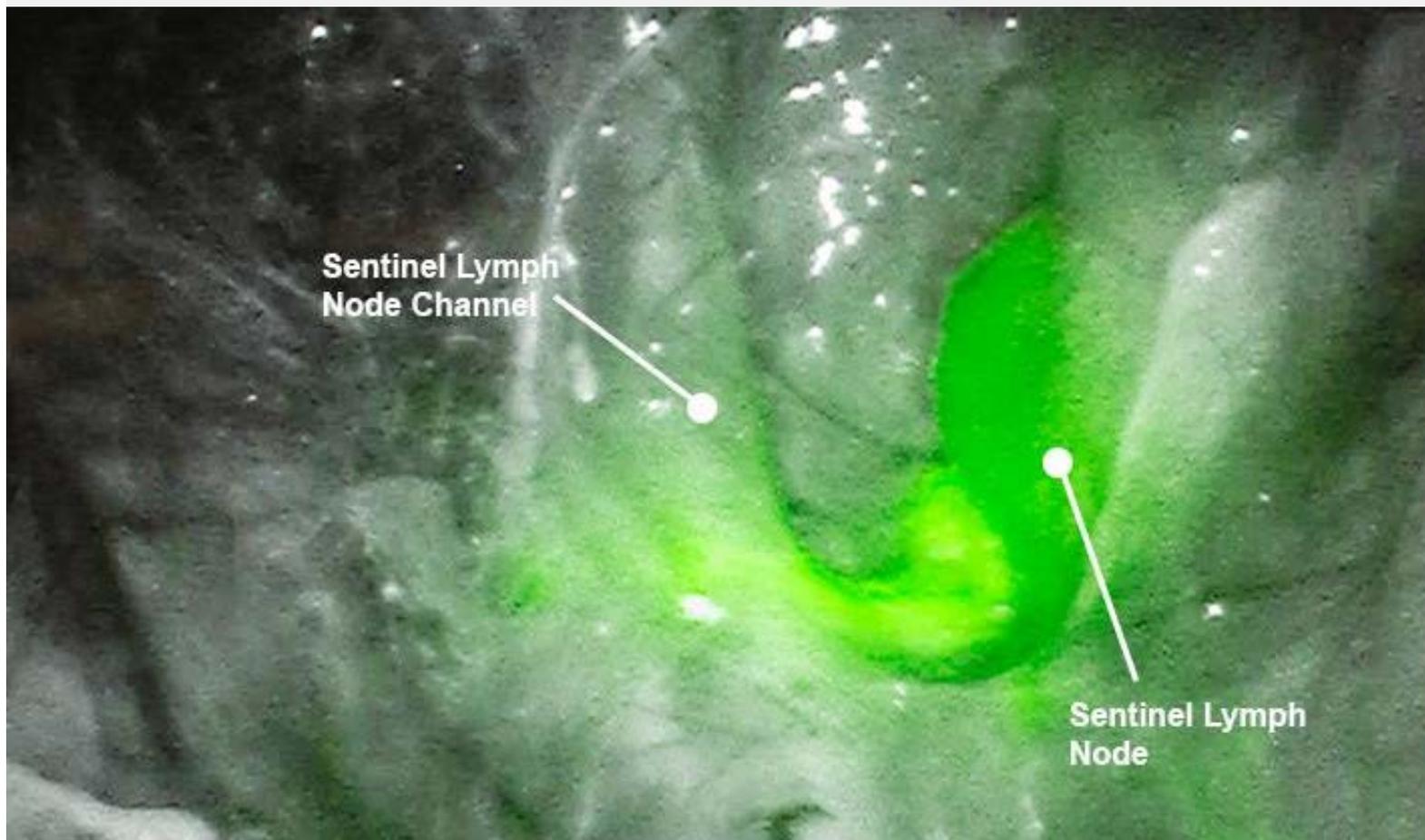
Jeffrey Brodsky, MD
Surgical oncology

“These are very difficult cancers with complex therapies, and there are not a lot of surgeons doing them,” says LVHN surgical oncologist **Jeffrey Brodsky, MD**. “Volume is critical. If you don’t have experience, you won’t have the best outcomes. Too many patients are seen by clinics that perform a handful of operations per year. We are by far the highest volume treatment center for GI cancers in the area, and we perform more than 100 pancreatic and liver resections annually.”

With all of those pieces in place, patients in the Lehigh Valley can now benefit from this collaborative approach to GI cancers.

“I am a big believer that MDCs and sub-specialization are the future of oncology,” Khalil says. “Having patients meet all providers at once, gaining a clear understanding of the short- and long-term plan, and making sure that no important clinical or supportive aspects are missed are the best ways to handle these cases. If I had a family member with GI cancer, this is how I would want them treated.”

To refer a patient to one of the LVHN cancer MDCs, call 610-402-CARE.



Sentinel lymph node mapping is performed using fluorescent image-guided surgery in conjunction with LVHN's robotic surgical platform to help surgeons identify the exact location of the most important lymph node.

Sentinel Lymph Node Mapping Available for Gyn Cancers

Surgical innovations made possible through MSK Cancer Alliance

Sentinel lymph node mapping (SLNM) – the process of identifying those nodes most likely to be cancerous – has been used to minimize unnecessary surgery for many cancer types. But for gynecological cancers, where lymph nodes are difficult to visualize, oncologists have typically had to rely on traditional en bloc resection. Patients often had as many as 40 lymph nodes removed, resulting in longer surgical times and, in some cases, significant side effects.

Now, Lehigh Valley Health Network (LVHN) is excited to bring this innovative surgical approach to patients with gynecological cancers. Through its membership in the Memorial Sloan Kettering (MSK) Cancer Alliance, LVHN gynecologic oncologists are using SLNM to reduce complications and morbidity, and more accurately stage disease.

Shifting toward minimally invasive techniques: 'When less is actually more'

When performing surgeries for endometrial cancers, oncologists must determine whether cancer has spread to lymph nodes to identify the optimal post-adjuvant therapy.

"In the past, we typically performed a full lymph node resection," says LVHN gynecologic oncologist [Martin Martino, MD](#), medical director of LVHN's minimally invasive robotic surgery program. "But recent research has shown that over 20 percent of patients who have a full lymph node dissection may develop lifelong lymphedema. With SLNM, we are now able to offer our patients an improvement in quality outcomes and fewer complications."

"For early-stage disease, we used to believe that more was always better – the bigger margins you removed, the smaller the chances of recurrence," says [Richard Boulay, MD](#), LVHN's chief of gynecologic oncology. "But we've found that's not necessarily so. The more normal tissue you remove, the more injury to surrounding structures, and the more complications.

"A patient with early-stage endometrial cancer has a 10-20 percent chance of having a lymph node



Martin Martino, MD

Gynecologic oncology

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



Richard Boulay, MD

Gynecologic oncology

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

involved. So if we can just find that node without removing all the others, we can eliminate that risk of complications for 80-90 percent of patients.”

Understanding SLNM

SLNM allows oncologists to identify the “sentinel” nodes – the first lymph nodes where cancer is likely to spread. The procedure is based on an algorithm developed at MSK. It’s performed using fluorescent image-guided surgery in conjunction with LVHN’s robotic surgical platform to help surgeons identify the exact location of the most important lymph node, known as the sentinel lymph node.

Prior to resection, oncologists inject a fluorescent green dye into two locations in the cervix and illuminate the site with infrared light. Lymph fluid carries the dye to the sentinel nodes, so surgeons can easily identify and remove them along with the tumor. Our pathologist then performs an ultra-stage examination of the sentinel nodes to determine if additional lymph nodes should be removed or if, as is often the case, no additional surgery is needed.

“Now that we’re performing almost all of these procedures laparoscopically, we already have a camera in place,” Boulay says. “With a flick of a switch, we can immediately see the sentinel nodes. In most cases, we can then just remove one or two instead of 10 or more.”

Improving outcomes

By reducing the number of nodes resected, SLNM reduces surgical times, complication rates and morbidity, and significantly reduces risk for lymphedema. “Even though we’re doing less invasive surgery, we’re actually doing more for our patients,” Martino says. “We’re able to help them get back to their lives faster, with fewer side effects.”

Additionally, every SLNM patient is surgically staged, so oncologists can more accurately determine the appropriate postsurgical therapy.

“Since pathologists have fewer nodes to examine, they can look at each node more closely,” says Nadeem Abu-Rustum, MD, chief of gynecology service at MSK and a pioneer of the technique. “They can perform serial sectioning to look for small-volume metastasis, which may be missed in traditional lymph node dissection. And, because we’re mapping based on the lymphatics in the uterus, we’re removing the enriched lymph nodes that are three times more likely to have cancer, while leaving healthy nodes behind.”

A strong partnership



Nadeem Abu-Rustum, MD
Memorial Sloan Kettering

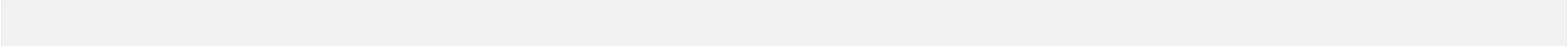
The introduction of SLNM is just one of the benefits of LVHN's membership in the MSK Alliance. LVHN has aligned many areas of its cancer practice with MSK standards, and LVHN physicians train with MSK oncologists on the latest surgical approaches.

“Through this partnership, we’re ensuring that we have both the technology and skills to perform procedures like SLNM,” Boulay says. “All three of our gynecologic oncology surgeons went to MSK to observe the algorithm firsthand, and then vetted our system to make sure we can process everything the same way.”

The result: patients in the Lehigh Valley now have access to the latest, most advanced therapies for gynecologic cancers.

“At the 2015 annual meeting of the Society for Gynecologic Oncology, just 28 percent of oncologists were using sentinel node mapping,” Abu-Rustum says. “These things take time, and change is difficult. What elevates the group at LVHN is that they are so flexible and open to change. They were willing to look at the data, look at the results and consider a new modality. That takes a very special team and leadership group.”

To refer a patient to LVHN gynecologic oncology, call 610-402-CARE.



Technology, Team Create ‘Miracle’ Recovery

Extracorporeal membrane oxygenation (ECMO) – which removes carbon dioxide and oxygenates blood – has proved successful in stabilizing patients with severe cardiac and pulmonary issues. The following case study highlights how ECMO therapy at Lehigh Valley Health Network (LVHN) saved the life of Justin Smith in February 2015.

Feb. 21, 7:30 a.m.

- Smith is discovered in a frozen field after being missing for 10 hours in sub-zero temperatures.
- Police and paramedics can find no pulse or heartbeat, and record his body temperature at 68° F, among the lowest on record for a patient who survived.
- Smith shows almost no brain function, with pupils inactive and eyes not moving
- Several organs, including kidney and lungs, have begun failing.
- Paramedics contact LVHN emergency medicine physician [Gerald Coleman, DO](#), expecting him to recommend formal declaration of death. Instead, Coleman orders them to begin CPR and bring Smith to Lehigh Valley Hospital (LVH)– Hazleton via ambulance.



[Gerald Coleman, DO](#)
Emergency medicine

Feb. 21, 8-9:50 a.m.

- Providers take turns performing manual CPR on Smith.
- Blood tests reveal normal potassium levels (4.7), indicating cells have not died off in large amounts due to deoxygenation. The team continues resuscitation.
- Coleman consults with cardiothoracic surgeon [James Wu, MD](#). They determine Smith is a

good candidate for ECMO.

- CPR continues as Smith is transported via MedEvac helicopter to LVH–Cedar Crest.

Feb. 21, late morning through evening

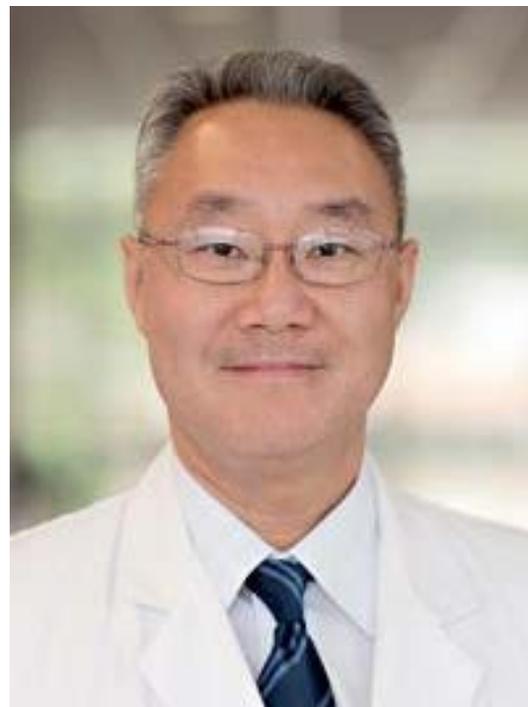
- Smith is connected to a venoarterial (VA) ECMO device to drain blood from the femoral artery, oxygenate it and return it to the arterial system.
- The team administers IV and heparin to prevent clotting, and monitors Smith's heart using an ECMO transesophageal echocardiography (TEE) probe.
- As Smith's body temperature reaches 86° F, his heart begins to fibrillate. The team employs emergency defibrillation. Smith begins to have slow, normal heartbeats, which grow faster as his body continues to warm.
- With Smith's heart achieving normal rhythm and pulmonary edema beginning to set in, the team switches to venovenous (VV) ECMO, inserting the tube through Smith's right neckline.

Feb. 22

- EEG and MRI imaging indicate normal brain function. Over the next four days, Smith begins moving and responding to his name.

March 5

- Smith opens his eyes for the first time.



James Wu, MD

Cardiothoracic surgery

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



John E. Castaldo, MD

Neurology

March 31

- Smith is transferred to the Good Shepherd Long-Term Acute Care Hospital at LVH–Muhlenberg.

April 7

- Smith eats his first meal since Feb. 20.

April 10

- Smith continues to progress and is transferred to Good Shepherd Rehabilitation Hospital.

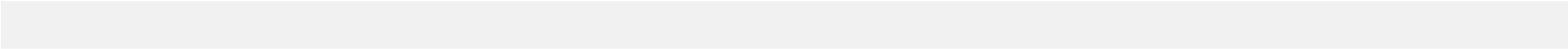
May 1

- Smith is discharged and returns home.

Despite the loss of all his toes and two fingers, and some minor neurological issues, Smith has made an amazing recovery. Today he plays golf, cheers on the Phillies and attends college.

As a result of Smith's case, the Pennsylvania Department of Health has updated its protocols for resuscitating patients with severe hypothermia and cardiac arrest, specifying they be transported to an ECMO-capable facility when possible. "I never in my wildest dreams thought the outcome would be as good as it was," says [John Castaldo, MD](#), LVHN chief of neurology. "It was a defining moment of multiple disciplines working together at their best."

To refer a patient to LVHN, call 610-402-CARE.





ERAS Pathway Extended to Gyn Onc Surgery

Standardized approach aims to improve outcomes, patient satisfaction

Patients undergoing gynecologic oncology surgery at Lehigh Valley Health Network (LVHN) may benefit from the enhanced recover after surgery (ERAS) protocol that minimizes stress to the body and seeks to restore normal function as quickly as possible. Use of the ERAS care pathway reduces length of stay (LOS), reduces complications and lowers health care costs.¹⁻³

A new approach

Developed more than 15 years ago in Europe, ERAS represents a significant shift in surgical care practices. Crucial care elements that contribute to improved outcomes include no prolonged fasting or bowel preparation, short-acting anesthetic agents and early ambulation. The core principles of ERAS require:

- **Preoperative patient engagement and education:** An integrated approach by the care team (surgeon, advance practice clinicians, nursing and support staff) prepares the patient for surgery. “This protocol is

designed to enhance the patient experience by reducing pain, nausea and vomiting so patients can return to normal activities,” says physician assistant Rachel Morcrette, PA-C, with LVPG Gynecologic Oncology–1240 Cedar Crest. “To accomplish that goal, patient education is essential. We engage with the patient so she is an active part of the care team.”

- **Standardization of intraoperative anesthesia:** The team follows an anesthetic and analgesic protocol to minimize narcotic usage and preemptively manage postoperative nausea.
- **Coordinated postoperative pain management:** Anesthesia providers oversee a regimen to manage pain and nausea with minimal use of narcotics.
- **Accelerated postoperative care:** Patients are encouraged to be mobile and to start eating and drinking as soon as possible after surgery. This approach reduces or prevents postoperative ileus and slowed bowel function.
- **Close postoperative follow-up:** All ERAS patients receive close follow-up to monitor progress. “ERAS’ emphasis on fast-tracking recovery is important because it allows patients to leave the hospital sooner, and for robotic surgery patients, even the same day,” says physician assistant Maria Smalley, PA-C, also with LVPG Gynecologic Oncology–1240 Cedar Crest.

Cohorted units

ERAS was first implemented last year at LVHN for elective colon-rectal surgery patients. In early 2016, a pilot was launched for gynecology oncology. LVHN will be expanding the multimodal perioperative care pathway for open surgery or minimally invasive (e.g., robotic, laparoscopic, vaginal) surgery across gynecology as a whole later this year. ERAS patients are cared for on cohorted units inside Lehigh Valley Hospital (LVH)–Cedar Crest and LVH–Muhlenberg by specially educated gynecologic oncology caregivers. The cohorted units also have additional staff to facilitate ambulation. The LVHN gynecologic surgery team anticipates ERAS will be implemented for as many as 60 gynecological surgery patients per month.

To refer a patient for gynecologic surgery, call 610-402-CARE.

1. “The enhanced recovery after surgery (ERAS) pathway for patients undergoing major elective open colorectal surgery: a meta-analysis of randomized controlled trials.” K. Varadhan et al. *Clin Nutr.* 2010; 29(4): 434–40.
2. “Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery.” M. Adamina et al. *Surgery.* 2011; 149(6): 830-40.
3. “Enhanced recovery for enhanced outcomes: the Mayo Clinic in Arizona experience.” K. Krishnan et al. American College of Healthcare Executives website.
<https://ache.org/pubs/research/mgmtinnovationsPDFs/images/Krishnan.pdf>.



The Children's Surgery Center includes 16 private pre-/postoperative rooms, four operating rooms, two procedure rooms and a nine-bay postanesthesia care unit. The center also features a reception and waiting area designed specifically for children and families, a play area located in the preoperative area, and private consultation rooms.

New Children's Surgery Center Focuses on Integrated Care

Facility, staff offer pediatric expertise

Recognizing that tailored clinical resources improve surgical outcomes for pediatric patients,¹ Lehigh Valley Children's Hospital in April opened the new J.B. and Kathleen Reilly Children's Surgery Center. Located on the third floor of the 1210 building on the LVH-Cedar Crest campus, the center features pediatric surgical specialists and proceduralists who use minimally invasive and state-of-the-art technology for outpatient procedures. More than

2,400 pediatric ambulatory surgical and procedural endoscopy cases are performed annually across Lehigh Valley Health Network (LVHN).

“The Children’s Surgery Center represents a milestone in providing safer and more reliable care in an environment that brings together people, processes and equipment focused exclusively on pediatric patients,” says [J. Nathan Hagstrom, MD](#), chair of pediatrics, LVHN.

Specialized facility

The Children’s Surgery Center includes 16 private pre-/postoperative rooms, four operating rooms, two procedure rooms (one dedicated for endoscopy) and a nine-bay postanesthesia care unit. The center also features a reception and waiting area designed specifically for children and families, a play area located in the preoperative area, and private consultation rooms.

The Children’s Surgery Center also is adjacent to other pediatric specialty services, such as LVPG pediatric hematology oncology practices, and other pediatric services and providers located within Lehigh Valley Children’s Hospital, such as intensivists, neonatal and pediatric intensive care units and the Children’s ER. In addition, the Children’s Surgery Center provides an expansion of existing pediatric surgical and procedural services including general pediatric surgery, pediatric urology, pediatric gastroenterology, and other pediatric surgical subspecialties including dental, otolaryngology (ear, nose and throat) and plastics.

“The Children’s Surgery Center demonstrates LVHN’s commitment to caring for the region’s children,” says [Marybeth Browne, MD](#), LVHN chief



[J. Nathan Hagstrom, MD](#)
Pediatrics



[Marybeth Browne, MD](#)
Pediatric surgery
[Watch a video to learn more about her.](#)

of pediatric surgical specialties. “The vast majority of pediatric conditions can be expertly treated either at the Children’s Surgery Center or at our Children’s Hospital, which benefits families and children by allowing them to stay close to home.”

Just as the American College of Surgeons National Surgical Quality Improvement Program Pediatric (ACS NSQIP® Peds) is employed to improve performance and patient safety at Lehigh Valley Children’s Hospital, Browne is using national standards to guide operations of the Children’s Surgery Center. Plans are in progress to seek Children’s Surgery Verification™ from the ACS during the next five years. The verification program requires pediatric surgery centers to provide appropriate preoperative, operative and postoperative equipment, staff, anesthesiology services and child-friendly surroundings.

Clinical expertise

Nationwide, a large percentage of children’s surgical needs are managed on an outpatient basis.¹ Although most procedures are performed safely and without complication, anesthesia is one of the most common risk points for pediatric patients.¹ The Children’s Surgery Center seeks to mitigate this risk by relying on an anesthesiology team consisting of board-certified pediatric anesthesiologists and a team of pediatric certified registered nurse anesthetists. “Additional training for pediatric anesthesiology is absolutely vital and distinguishes the care we provide,” Browne says.

The Children’s Surgery Center also provides access to care by subspecialists such as [Michele Clement, MD](#). One of only 325 fellowship-trained pediatric urologists in the U.S., Clement performs approximately 400 outpatient surgical procedures annually, and provided input on issues related to workflow at the new facility.

“We’re very interested in creating a safe space for children and their families so, for example, we looked at ways



Michele Clement, MD
Pediatric surgery

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



Sri Chennupati, MD
Pediatric surgery

staff can access technology without intruding on families,” Clement says. “In addition to performing surgery in the best possible way, it’s important to care for the emotional and social needs of children and their families. Medical care is only part of the puzzle of caring for children.”

The center’s opening coincided with the arrival of a pediatric ear, nose and throat specialist, [Sri Chennupati, MD](#). Chennupati previously served as an assistant professor of pediatrics at Drexel University College of Medicine and attending otolaryngologist at St. Christopher’s Hospital for Children in Philadelphia. At the Children’s Surgery Center, he anticipates performing more than 400 procedures annually to treat common conditions such as tonsillitis, sinusitis and ear infections (otitis media).

“I’m impressed by the commitment to excellence that LVHN is expressing by opening the Children’s Surgery Center,” Chennupati says. “Patients and families will benefit from access to care that is designed especially for them.”

Family-friendly environment

The Children’s Surgery Center seeks to create a family-friendly atmosphere by:

- Encouraging parents, siblings and other family members to join pediatric patients pre- and postop
- Performing procedures in the same building as many of the surgical and medical practices that pediatric patients access
- Providing tours of the surgical suite, which reduce patient and family anxiety
- Making a child-life specialist available

“We are committed to creating a satisfying patient and family experience that integrates all of the requirements for pediatric ambulatory surgical care into an organized, efficient setting by linking the components of seamless care from physician office to operating room and finally to a return to wellness at home,” Browne says.

To refer a patient to the J.B. and Kathleen Reilly Children’s Surgery Center, call 610-402-CARE.

1. “Optimal resources for children’s surgical care in the United States.” J Am Col Surg. 2014; 218(3): 479-87.