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Cross-Disciplinary Program Improves Surgical Outcomes for Older Patients

Compared with younger adults, older individuals have higher rates of complications from surgery. But many problems can be avoided by intervening with assessments and risk-reduction strategies before, during, and after procedures, according to a study that examined surgical outcomes of patients in Duke’s Perioperative Optimization of Senior Health (POSH) program—a coordinated effort between the surgery, geriatrics, and anesthesiology departments to help older patients have a safe surgical experience and smooth recovery.

In the study, published January 3, 2018, in *JAMA Surgery*, researchers found that patients enrolled in the POSH program had shorter hospital stays by an average of 2 days than patients who underwent similar surgeries but were not enrolled in the program. They also had lower readmission rates, with 2.8% readmitted within 7 days of discharge and 7.8% within 30 days, compared with 9.9% of standard-care patients readmitted within 7 days and 18.3% within 30 days.

“Our study shows that older adults do better when we proactively identify individual risks—particularly those associated with aging—and implement optimization strategies across a longer preoperative and postoperative timeframe,” says lead author and Duke geriatric medicine specialist Shelley McDonald, DO, PhD.

Obesity Can Add 5 Weeks of Asthma Symptoms Per Year in Preschoolers

According to new research from Duke and collaborators, asthma symptoms may be worse for children aged 2 to 5 years who are overweight.

In a study published December 19, 2017, in the *Journal of Allergy and Clinical Immunology*, researchers found that children with asthma who were untreated and overweight had 37 more days of symptoms and had more asthma attacks than their untreated peers of a healthy weight.

Fortunately, obesity doesn’t seem to lessen the effectiveness of corticosteroid inhalers, says Jason Lang, MD, a pediatric lung specialist and director of the Duke Children’s Pulmonary Function Laboratory, who led the study. When used daily, inhalers reduced the number of symptom-days and asthma attacks in both healthy and overweight children.

“Weight does not hamper the effectiveness of inhaled steroids in preschoolers, but this study provides clear evidence that maintaining a healthy weight in preschoolers may be an effective strategy for controlling asthma,” says Lang.
Simple tips can help patients minimize financial toxicity.

A recent study in the *Journal of the American Medical Association* brought stark attention to the fact that per capita spending on prescription medications is higher in the United States than in any other country in the world. Numerous other studies have revealed that patients with cancer are among the most vulnerable when it comes to the cost of their treatment, particularly the cost of lifesaving medications.

“The drug prices are higher and the treatments are longer for patients with cancer,” says Yousuf Zafar, MD, an associate professor of medicine and public policy at the Duke Cancer Institute.

Drug costs are one component of the larger overall challenges of health care costs that Zafar calls “financial toxicity.” But, the high—and growing—cost of prescription medication is contributing to a disturbing trend of cancer patients delaying or skipping their treatments because they believe they can’t afford them. Zafar was lead author on a 2013 study published in *The Oncologist* showing that 25% of patients with cancer chose to not fill a prescription because of cost, and 20% filled only part of it or took less than what was prescribed.

For older patients with cancer, the cost of prescription medications is an even bigger challenge. A recent *JAMA Oncology* study showed that Medicare patients with cancer spend an average of 11% of their income on treatment. “Cancer patients are sensitive to the costs of treatment, even if it is lifesaving,” Zafar says.

For doctors caring for patients with cancer—or patients with other chronic health diagnoses—this means helping to identify opportunities to minimize prescription costs, particularly for patients who have the greatest risk of experiencing financial toxicity.

Zafar recommends that doctors act early and often and consider the following strategies:

**Educate.** Once patients have a diagnosis, it’s important that doctors prepare and inform them about the costs of treatment. Beyond the cost of medication, for example, there are other expenses such as the cost of provider and clinic visits, surgery and radiation treatments, and home care.

**Screen.** Clinicians should be direct about asking their patients whether they can afford treatment,
which should be part of a screening mechanism to determine whether there will be a financial burden. If needed, providers may be able to make changes to treatment plans that consider a patient’s financial circumstances.

**Connect.** If it’s clear that affordability will be a factor, providers can work with insurers on behalf of their patients or link them to financial counselors or patient assistance programs (PAPs) that can help alleviate the economic burden of treatment. Although the application process for PAPs can be challenging, it’s important that patients know about such resources.

Ultimately, this all comes down to what doctors care most about: the well-being of their patients.

Not addressing the financial distress related to treatment for cancer patients may translate into a higher risk of mortality.

“This needs to be an ongoing conversation between oncologists and their patients,” Zafar says. In a 2015 *Journal of the National Cancer Institute* commentary, he advises oncologists to focus on the value of care delivered, encourage patient engagement on the topic of costs, and be tuned in to the financial resources available to patients.

“With a growing list of financial side effects induced by cancer treatment, the time has come to intervene on the financial toxicity of cancer care,” he says.

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**Patient Assistance Programs**

Physicians can help their patients who are concerned about the cost of their prescription drugs by guiding them through PAPs. Patients may be eligible for programs run by drug companies, state governments, or nonprofit groups, such as:

**Partnership for Prescription Assistance** offers programs sponsored by a consortium of drug companies, doctors, and advocacy and civic organizations that help low-income, uninsured patients obtain free or low-cost, brand-name medications.

**NeedyMeds** maintains an extensive database of PAPs, state assistance programs, drug discount programs, and free or low-cost medical care. The organization also has information about thousands of programs to help patients through the application process.

**Center for Benefits** is a program of the National Council on Aging that shares information about assistance programs for low-income seniors and young people with disabilities.

**RxAssist** houses an online database of drug company programs that offer free or affordable drugs and copay assistance.

**RxHope** provides an online resource to search by medication to locate assistance programs. The resource also offers help with the application process.

**RxOutreach** is a mail-order pharmacy for patients with little or no health insurance coverage.
Breast cancer treatment at high-volume centers is associated with an 11% reduction in overall mortality compared with lower-volume centers, according to study results published in February 2018 in the *Annals of Surgery*. Although improved outcomes were seen for all stages, patients with stage 0-I, ER+/PR+, and ER+/PR- breast cancers received the most benefit.

With a cohort of 1,064,251 patients, the study is the largest series to examine the effect of hospital volumes on patient outcomes in breast cancer. It is also the first to define case volume thresholds based on clinical outcome rather than arbitrary cutoffs.

These results can help patients with breast cancer decide where to undergo treatment, the authors note. The American Society of Clinical Oncology and American College of Surgeons Commission on Cancer currently recommend that women select a surgeon based on specialization and practitioner experience. The authors suggest that hospital case volume should also contribute to that decision.

“Regardless of patient age or tumor biology, all individuals with breast cancer benefit from receipt of treatment at high-volume centers, just like other less common malignancies,” says the study’s lead author, Rachel Greenup, MD, MPH, a breast cancer surgeon at Duke. “Case volume most likely reflects the subspecialty expertise and infrastructure required to deliver tailored contemporary breast cancer care.”

To examine the association between hospital volume and mortality, investigators queried the American College of Surgeons/American Cancer Society National Cancer Database. All patients between 18 and 90 years of age who were diagnosed with unilateral stage 0-III in situ or invasive breast cancer from 2004 to 2012 and treated with lumpectomy or unilateral or contralateral mastectomy were included in the analysis. Investigators used restricted cubic spline analysis to create 3 hospital volume groups: low volume (< 148 cases/year), moderate volume (148-298 cases/year), and high volume (> 298 cases/year).

Rates of lumpectomy, unilateral mastectomy, chemotherapy, endocrine therapy, and radiation therapy were similar between groups. And, although contralateral mastectomy was also slightly increased at higher-volume centers, studies have shown that this approach does not affect survival. It is more likely, the authors argue, that volume in breast cancer is a proxy for the subspecialty infrastructure required for excellence in multidisciplinary oncology care. (Colored mammo-gram above shows breast cancer.)
The urgent need to decrease costs and improve care in the US health care system is leading more health systems and physicians to adopt a value-based approach. This care model reflects the idea that physicians should be held accountable for the care they provide in terms of outcome, quality, and cost, explains Dev Sangvai, MD, the associate chief medical officer for Duke University Health System. “How do you ensure that care is delivered in an efficient manner and that it’s appropriate, backed by evidence, and cost-effective?”

Evidence shows that engaging in value-based care can improve patient outcomes, satisfaction, and engagement while also decreasing costs to patients and providers. Integrated systems with effective electronic health records (EHRs) can reap the greatest benefits. “If you’re able to share and see lab results between hospitals and different practices with an EHR, you’re going to decrease duplication of care, decrease costs, and improve your performance,” explains Robert Nesse, MD, a family doctor, senior director of policy and payment reform for the Mayo Clinic, and chair of the High Value Healthcare Collaborative board.

To achieve success (and save money) in the new value-based environment, Nesse says that medical groups should have 5 prerequisites in place:

1. A network of providers who are responsible for a patient’s care over time, which should include hospitals, physicians, and post–acute care providers.

2. An aligned purpose, such as agreeing upon a total cost of care for up to 90 days for select diagnoses. The network of providers can designate approaches for decreasing the cost of care while maintaining good outcomes.

3. A coordinated care plan with integrated services that prevents hospital readmissions and improves care. “That will save big money,” Nesse says. For example, coordinated care between hospitals and subacute nursing facilities can shorten nursing facility stays.

4. Timely, actionable analytics. “If doctors want to preserve outcomes and decrease costs, they must have a global view of cost and understand every segment of that cost in great detail or they can’t manage it,” Nesse explains.

5. An aligned payment model among all providers.

“For me, saving the patient money, improving outcomes, and decreasing the costs is kind of why [physicians] go to work in the morning,” Nesse says. “We’ve got to start doing this right now because the cost of care is not sustainable.”

Sangvai acknowledges that it can be daunting to think about preparing for a new care model while simultaneously focusing on delivering good care. “My advice is to be active, pay attention, and take the right amount of risk,” he says.
CASE STUDY

Novel Procedure Reduces Spinal Curvature, Avoids Fusion

By Tim Pittman

Concerned about an unnatural curve in their daughter’s spine, the parents of a 10-year-old girl made an appointment with a pediatrician. The physician promptly diagnosed the spinal curvature as early evidence of scoliosis. After conferring with the parents, the physician referred the patient to Duke for further assessment.

Given the patient’s age, Robert K. Lark, MD, MS, a pediatric orthopaedic surgeon who also specializes in spinal procedures, recommended a novel procedure designed to modify the spine’s natural growth. Lark was the 10th surgeon in the United States to perform vertebral body tethering.

The growth modulation technique is designed to promote straighter, more natural spine growth in young patients with scoliosis. During the procedure, the surgeon uses a polypropylene rope to tether the spine along the convex side of the curve, Lark says. “We are able to gradually correct the angular deformity with a flexible tether that should allow more natural spinal flexibility.” The spine’s natural growth is shaped by the tethering technique.

Lark performed the procedure in August 2017 when the patient was 11 years old. He and the patient’s parents were pleased with the outcome and prognosis 3 months after surgery. “We saw that her waistline had straightened out and her shoulders were not protruding as far,” Lark says.

“She’s had a very successful outcome.”

Lark, who has had special training in the procedure, says the technique requires customized approaches for each patient. “That’s part of the art of this procedure,” Lark says.

Vertebral body tethering remains a relatively rare procedure, he adds. Only a few academic medical centers in the eastern United States are able to offer the option to appropriate candidates.
When it comes to contract negotiations, commercial payers tend to have the upper hand. Indeed, it usually hurts a payer far less to walk away from a provider than vice versa. However, a weak hand is not always a losing one, and there are several ways for physicians to improve their position at the bargaining table.

First, it is important to understand your practice’s strengths and weaknesses and to maintain supporting data. What are the most frequently performed services? How many other practices near yours offer the same services? If quality outcomes are your strength, then demonstrating long-term savings is the goal. The metric most persuasive to payers is reduced hospital readmissions.

Additionally, be aware of subtle negotiating tactics. For example, payers may present average rates rather than specific ones. Averages can be skewed by inflating prices for less frequently performed procedures. Another pitfall to watch for is notification of changes. Make sure the contract calls for in-person notification. Lack of adequate notification can lead to surprise rate reductions.

Most physicians are fairly savvy about rates, according to Barry S. Herrin, founder of the Atlanta-based law firm Herrin Health Law. However, many often need help with nonrate details, which can equally impact a provider’s bottom line.

A recent trend to watch for is high-deductible plans encouraged by the Patient Protection and Affordable Care Act, Herrin says. Network agreements now insist these high deductibles cannot be waived, requiring practices to collect large sums of money that many patients may not have.

The other side of the coin involves payers subcontracting with entities like auto and workers’ compensation insurers without providers’ knowledge. These payers usually offer higher rates than commercial health insurers, so a practice may actually be leaving money on the table by being in-network.

“In other words, you have to police not only the rate but also the people to whom the rate is available,” concludes Herrin. “The agreement may say, ‘From time to time we may lease this network to so and so if they agree to pay the rates stated herein.’ Well, that sounds innocuous, but anyone who has been in this business for any length of time knows what it means.”

Herrin explains that providers can avoid this by insisting on prior approval over any expansion of payers covered by the agreement.
New Guidelines for Ventricular Arrhythmias, Sudden Cardiac Death

By Tim Pittman

Joint committee provides first updated clinical directives in more than a decade.

New guidelines for the treatment of ventricular arrhythmias (VA) and the prevention of sudden cardiac death (SCD) offer the first updated recommendations in more than a decade from the American College of Cardiology, American Heart Association, and Heart Rhythm Society.

Duke electrophysiologist Sana Al-Khatib, MD, MHS, who chaired the writing committee, says the comprehensive decision-making process focused on the daily challenges that clinicians encounter in managing patients with VA or a risk of SCD.

The new guidelines provide updated directives for many types of arrhythmia and encourage genetic counseling, as well as cost and value considerations. Al-Khatib says the guidelines establish several first-time recommendations in the United States for specific VA and SCD conditions:

- Subcutaneous implantable cardiac devices (ICDs)
- Management of ICDs in patients with left ventricular assist devices (LVADs) and patients who have undergone transplant
- Shared decision making and terminal care planning with patients

Updated for the first time since 2006, the guidelines were completed in 18 months compared
Key Updates in the Guidelines

- Provides recommendations on the use of medications, types of defibrillators (implantable through the vein or under the skin vs a wearable defibrillator), and catheter ablation for the prevention of SCD. These are the first US guidelines that include recommendations on subcutaneous ICDs.
- Offers updated recommendations on catheter ablation of VA, from the most benign (premature ventricular contractions) to the most ominous conditions (ventricular fibrillation).
- Recommends that a shared decision-making approach should guide treatment decisions to embrace a patient’s health goals, preferences, and values.
- Encourages genetic counseling and testing for certain diseases to inform clinical decisions.
- Urges providers to inform patients with ICDs about the risk of SCD and non-sudden death from heart failure or non-cardiac conditions, as well as the effectiveness and potential complications of ICD.
- Recommends that clinicians discuss ICD shock deactivation for patients who are approaching the end of their lives from other illness. This discussion should include a review of patients’ goals and preferences.
- Encourages the consideration of cost and value factors when reviewing strength of evidence surrounding ICD cost-effectiveness.

“I believe these guidelines will help clinicians provide excellent care to patients for many years to come.”

with a typical process requiring 24 to 36 months. In addition, a new, modular presentation offers a more readable format.

“These guidelines provide evidence-based recommendations on the management of adults who have VA or who are at risk of SCD, including diseases and syndromes associated with a risk of SCD from VA,” Al-Khatib says. “I believe these guidelines will help clinicians provide excellent care to patients for many years to come.”

X-ray of a patient who has a pacemaker and an LVAD.
Population health management (PHM) became prominent in 2003 after David Kindig, MD, PhD, and Greg Stoddart, PhD, defined it as “the health outcomes of a group of individuals, including the distribution of such outcomes within the group.”

Today, PHM has become less a trendy term and more a necessity for survival. In fact, recent research revealed that 68% of health care executives ranked PHM as “very important” to care delivery.

Physicians who wish to implement or streamline a PHM system may find the landscape overwhelming. Starting with a strategic roadmap is essential, says Wendy Vincent, director of advisory services at the audit and consulting firm KPMG. “Organizations that do this well have very clear, well-defined care plans,” she says.

The following tools can help providers institute an effective PHM program.

**Electronic health records (EHRs).** Providers can use existing EHRs to develop master patient registries and a health maintenance template, according to the American Medical Association. These can track patient immunizations, screenings, and other tests, and the option to create these records is already available in most EHRs. Maintenance templates can even be programmed to prompt providers to deliver certain services.

**Patient dashboards/scorecards.** Dashboards and scorecards offer an easy way to visualize relevant data that include risk scores, acuity, and wellness trends. Sometimes called “scoreboards,” they are one of the best tools to measure and sustain improvements to outcomes.

**Automated outreach.** Automated care-management outreach includes tools such as email that are generated based on clinical protocols and connected to a population-wide electronic registry. The software detects when patients need services and contacts them to make an appointment.

**Analytics.** Analytics for managing patient data and integrating clinical or business intelligence into workflows are essential. Analytics tools not only enable more targeted health management programs but also enhance quality, cost, and efficiency of care.

According to Vincent, it’s important to remember that, ultimately, “technology should support the optimal gold standard in workflow, not the other way around.”
Duke First in North Carolina to Offer New Sleep Apnea Treatment

By Catherine Lewis

Although moderate to severe sleep apnea can often be managed by using continuous positive airway pressure (CPAP) therapy—the front-line treatment—many patients cannot tolerate this intervention. Now, these patients have a new option: hypoglossal nerve stimulation (HGNS), an approach that harnesses the patient’s own motor neuron system to control the muscle tone of the upper airway. Duke is the only health system in North Carolina to offer the procedure, performing its first in August 2017.

An estimated 50% of patients with a CPAP prescription don’t use the machine long term, says Matthew Ellison, MD, a Duke otolaryngologist who performs HGNS. “Sometimes people get skin reactions from the CPAP mask, or they have issues with claustrophobia,” he explains. “For others, CPAP simply doesn’t eliminate apneic events. What that means is that there’s a large population of patients with untreated sleep apnea who could benefit from HGNS.”

HGNS has advantages over surgical options as well, he adds. Whereas other surgical treatments rely on removing or translocating tissue, which can soften or relax over time, the new system offers a more long-term solution.

HGNS technology comprises 3 parts: a nerve stimulator implanted around the distal branches of the hypoglossal nerve to control tongue movement and tone; a small, programmable pulse generator; and a respiratory intercostal muscle pressure sensor. It reduces airway obstruction by moving the tongue forward and tensing the tongue muscle itself when the patient is breathing in, cycling on and off.

The system is implanted in a relatively straightforward outpatient procedure before being activated 1 month later. Two months after the initial surgery, patients visit the Duke Sleep Disorders Center to have the machine’s voltage adjusted.

Having seen the new technology’s potential, Ellison believes HGNS is an option for any adult patient with moderate to severe sleep apnea who has tried CPAP without success within the past 2 years.

“The clinical trials have been very encouraging, and the system is getting better and better. The more we refine the technical aspects of implanting the device and fine tune the activation process of the system,” he remarks. “It’s allowed us to achieve a whole new level of success compared with previous treatments—it really is a totally different approach to treating sleep apnea.” (Image above is courtesy of Inspire Medical Systems, Inc.)
A 25-year-old woman experiencing lower back pain, hematuria, and swelling in her lower joints and limbs presented to a urologist in western North Carolina. Following laboratory tests and a computed tomography (CT) scan, physicians diagnosed her with Nutcracker syndrome (NCS), a renal vein entrapment condition with multiple variants. The patient was referred to the Duke Division of Urology to consider treatment options.

A urologist suggested that the patient consider nonsurgical therapies, such as blood thinners or stent insertion. But the patient, preparing for a career in law enforcement, expressed concern that lifelong use of blood thinners might limit her professional opportunities and that the stent might not provide a permanent solution. She asked about surgical options and was referred to Cynthia K. Shortell, MD, Duke’s chief of vascular and endovascular surgery.

The patient’s vena cava was situated on the wrong side of the body, compressed between the mesenteric artery and the aorta. After discussing options and risks with the patient, Shortell performed an uncommon procedure—transposing the gonadal vein onto the vena cava to decompress the left renal vein. The standard technique is transposition of the renal vein.

Shortell says the gonadal vein procedure confers a lower risk of renal vein thrombosis and subsequent kidney loss than renal vein transposition or renal vein stenting.

"For patients who meet these criteria, our corrective procedures have a very high success rate."

“We dissect the gonadal vein, swing it over within the body, and attach it to the vena cava,” says Shortell. “That allows blood from the renal vein to flow into the vena cava instead of flowing through the renal vein itself.”

The procedure was curative. Following a routine, postoperative, temporary course of blood thinners, the patient gradually regained full vascular function and was free of symptoms. Thirteen months after surgery, she began to train for the physical component of the federal law enforcement program; she successfully completed training in less than 2 years.

Shortell, who is often contacted by self-referring patients for this condition, performed 47 renal
Nutcracker Syndrome: A Diagnostic Snapshot

The first clinical description of this syndrome appeared in 1950. The term Nutcracker syndrome (NCS) is thought to have been first used in 1972.

- NCS presents with many symptoms in both adults and children. It may also be an incidental finding, without symptoms, in which case it should not be treated.
- Hematuria is the most common symptom. Venous pressure causes thin-walled varices to rupture.
- Pain is the second most commonly reported symptom. Abdominal or flank pain occasionally radiates to the thigh and buttock.
- Other symptoms include pelvic congestion in women, in which varicose veins in the lower abdomen cause pain and heaviness in the pelvis or genital area. Women may experience pain during sexual intercourse.
- Varicoceles may be present in men.
- Other symptoms that may be present: varicose veins in the legs, severe menstrual cramping, painful urination, or low energy.

entrapment surgeries in 2017. She cautions that diagnosis of the condition is challenging.

“There is a lot of confusion around how to treat NCS and other entrapments,” she says. “Imaging is not always definitive. Some patients don’t have true NCS.” Shortell looks for 3 specific criteria:

- Cross-pelvic collateral (a condition in which blood is being forced in the wrong direction because of abnormal flow)
- Hematuria
- Pain in flank or pelvic regions that is anatomically aligned with the areas of compressed blood flow

“For patients who meet these criteria, our corrective procedures have a very high success rate,” she says. (Intraoperative image on the previous page shows posterior NCS in a different patient, in which the left renal vein is compressed as it passes behind the aorta. Reprinted with permission from Said SM, et al. Sem Vasc Surg. 2013;26:35-42.)

Varicose veins in the left thigh of a different patient after phlebography.
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