



FALL 2015

Duke Surgery

United, for *All* Patients



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Duke Surgery Helping Wounded Warriors

Statewide, Duke University Medical Center has a reputation for treating many of North Carolina’s most complicated medical cases. Its healthcare providers offer comprehensive primary and specialty care services, and they have the capabilities to treat anyone who walks through its doors.

But, it’s the Department of Surgery’s focus on contributing to improving medical care for the military that is gaining growing attention. Increasingly, the institution’s clinical care and research resources are being funneled into helping wounded warriors.

It’s an added benefit, says Allan Kirk, MD, PhD, Professor and Chair, Department of Surgery, that much of the work can be translated to civilian populations, as well.

“This ongoing work is important because we’ve learned a lot about how to take care of injured soldiers and sailors,” he says. “But, it’s turned out the things we’ve learned are good for civilians, too, such as those injured in car wrecks, or with gunshot wounds, or falling off scaffolds.”

Not only do these endeavors augment treatments providers can offer in large hospitals, but they also improve therapies soldiers receive in the field and long-term rehabilitative efforts.

Using Research to Improve Care

In collaboration with the Uniformed Services University of the Health Sciences (USU) and Emory University School of Medicine, Duke is at the forefront of taking scientific

“In collaboration with the USU and Emory, Duke is at the forefront of taking scientific discoveries and translating them into products that can care for soldiers both on the front lines and in hospitals.”

discoveries and translating them into products that can care for soldiers both on the front lines and in hospitals, Dr. Kirk says.

Overall, a \$44 million grant from the Henry M. Jackson Foundation for the Advancement of Military Medicine (HJF) funds this partnership. Duke receives \$2.5 million annually and shares it



with Emory to recruit patients to participate. Currently, 30 Duke patients are involved, with the goal of enrolling 400 patients over four years.

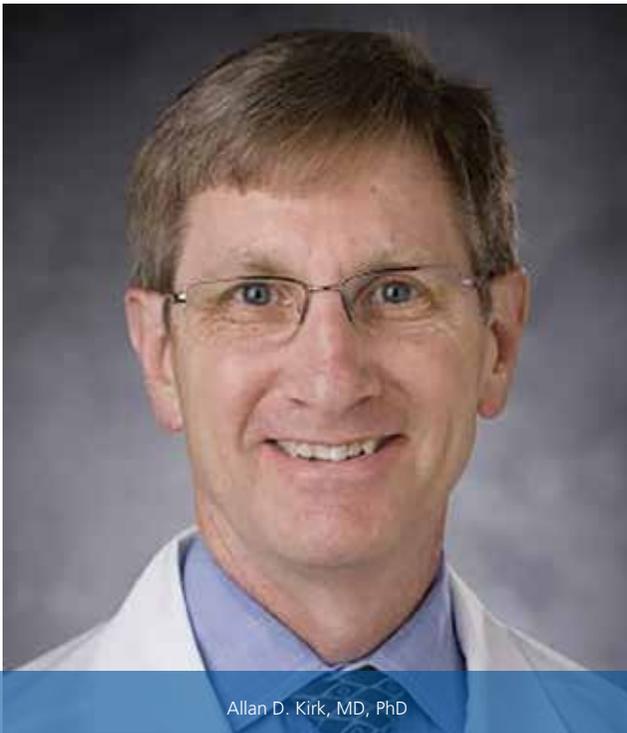
As the lead civilian research institution, Duke is well positioned to fuse available brain power and resources.

“The scientific and clinical missions of Duke are so intertwined that it makes the institution the perfect place to look for biological

correlations of diseases and to do clinical trials with people who have critical illnesses,” Dr. Kirk says. “Duke has always been a much more scientifically-driven and biologically-driven Department of Surgery than most.”

It’s that close basic-translational science relationship that positions Duke to accomplish innovative things, he says. Through the grant, this partnership has already produced several products designed to treat wounded soldiers in the field. They can also be transitioned to help civilian patients, Dr. Kirk says.

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Allan D. Kirk, MD, PhD

MESSAGE FROM THE CHAIR

I am pleased to present the Fall 2015 issue of the Duke Department of Surgery Newsletter. Over the previous six months, important changes in the department have significantly advanced our mission to improve patient care, train the next generation of leaders, and translate research discoveries into treatments for patients.

A major organizational change from this summer was the merge of the Division of Otolaryngology–Head and Neck Surgery and the Division of Speech Pathology and Audiology into the new Division of Head and Neck Surgery and Communication Sciences (HNSCS). This reorganization will result in greater administrative efficiencies and improved opportunities for clinical, research, and educational collaborations. Dr. Ramon Esclamado serves as the Division Chief of HNSCS, and Dr. Frank DeRuyter serves as the Section Chief for the Speech and Audiology section within HNSCS.

An integral part of Duke Surgery’s mission is to enable the discovery of solutions to health care challenges. In September, Duke Surgery participated in the first annual Innovation Jam from the Duke Institute for Health Innovation. Several of our faculty and residents successfully secured funding for projects designed to improve health care delivery, including Dr. Jeffrey Lawson’s “poke-proof” dialysis graft, featured in this newsletter. Importantly, this event resulted in the funding of many novel multidisciplinary collaborations between the Department of Surgery and other School of Medicine departments.

Clinical care at Duke increasingly focuses on improving health care services for wounded service men and women. In our cover story, we highlight a new collaboration between the Department of Surgery, Emory University, and the Uniformed Services University of the Health Sciences. With funding from the Henry M. Jackson Foundation for the Advancement of Military Medicine, Duke Surgery is catalyzing innovations in surgical care to improve the treatment of wounded warriors both at home and in the field, and looking for ways to apply these strategies to the civilian population. Additionally, we have launched a hand transplantation program under the direction of Linda Cendales, MD, an expert in vascularized composite allotransplantation. This program is currently recruiting patients, both service men and women and civilians.

We are proud of the many accomplishments of our faculty and staff. I would like to recognize Dr. Shelley Hwang in the Division of Advanced Oncologic and GI Surgery whose revolutionary approach toward the treatment of patients with ductal carcinoma *in situ* (DCIS) was recently featured in a cover story in TIME magazine.

I hope you find this newsletter helpful, and I look forward to hearing from you.

Sincerely,

Allan D. Kirk, MD, PhD
David C. Sabiston, Jr. Professor and Chair
Department of Surgery
Duke University School of Medicine

Duke Department of Surgery

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Duke Surgery Helping Wounded Warriors

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WoundX: This tool uses a patient's individual immunological and biological responses to help physicians determine whether they should manually close a slow-healing wound or let it continue to heal on its own. Making the right decision, Dr. Kirk says, could help patients avoid unnecessary follow-up surgeries.

Massive Transfusion Protocol: Deciding whether to provide a blood transfusion requires close examination and analysis of a patient's status over time. Transfusions are resource-intensive and expensive, so it's not a choice made lightly. Through the grant, the team developed a smartphone application that uses a sophisticated statistical model, based on admission variables, to accurately identify patients who will benefit from a transfusion. It is being beta-tested at Grady Memorial Hospital in Atlanta.

Decompensation: A significant part of successful medicine, Dr. Kirk says, is knowing when to leave a patient alone and when he or she is decompensating or worsening. Through real-time analytics, providers can keep closer tabs on when a patient is progressing or failing. The intent is to individualize care based on how a person responds to treatment specifically rather than provide services based on average responses.

These products will enable providers to offer patients therapies that meet their individual needs.

"When we talk about immune complications, people fail to recognize each person comes to their injury with a unique set of immune experiences," says Dr. Kirk. "You have different viruses, injuries, and vaccines. That immune experience accumulated over 20 to 30 years, and it changes how you will respond to a particular injury."

Improving Field Fidelity

While treating injured soldiers who return from the field is important, time for intervention is often limited and critical. Consequently, it's vital for field medics to be proficient with the tools they have for diagnosing potential life-threatening issues, says **Mark Shapiro, MD**, Associate Professor, Division of Trauma, Critical Care, and Acute Care Surgery, and Acute Care Surgery Chief.

Duke's 18 Delta Medical Proficiency Training program exposes Special Forces medical staff to these skills. The initiative, borne out of a collaboration Dr. Shapiro experienced on a trip to Haiti, allows participants to learn about ultrasound technology in Duke's simulation Surgical Education and Activities Lab (SEAL). It phased out a previous instruction program that relied on live tissues, and it's a way for participants to practice risk-free and receive constructive criticism.

"These soldiers are fully engaged, and they invite criticism," Dr. Shapiro says. "They are extraordinary heroes who want to do more, and it doesn't matter what more is. Whatever the criticism is, they'll fix it."

Every four years, Special Forces medical staff are required to complete the proficiency training. Duke offers this training, and soldiers take it back with them to the base and on deployment. Led by **Brianne Steele, MD**, Assistant Professor, Division of Emergency Medicine and Ultrasound Director, Special Forces complete a 30-day, 6-hour-a-day course, training in multiple elements of medicine and surgery.

One day of training is devoted to diagnostic ultrasonography, and medics can opt to spend additional time in the SEAL lab with residents. They also receive training in using regional anesthetic blocks that can provide pain relief while keeping soldiers active in the field.

Alongside learning how ultrasound works in the simulation lab, participants also learn how to best hold the probe. Dr. Steele provides guidance on how to read the shadows and shades of grey that appear in any ultrasound image. Participants, then, have the opportunity to practice on their own in the simulation lab.

"Conducting a number of exams in the simulation lab gets soldiers comfortable with the fidelity of the machines," Dr. Shapiro says. "They can take all their rotation experience here down range and apply it to their encounters. They've learned how to describe what they see better and better link up with medical command."

Extensive practice teaches participants to catch nuances of individual injuries that could be either life-altering or life-saving. And, mastering this skill set allows them to offer real-time aid to soldiers and civilians alike.

"It's important to keep soldiers engaged in the firefight or help them recover," Dr. Shapiro says. "But, ultrasound can be used to relieve the pain of local residents. Doing so can have an enormous effect on how we are accepted in the field."

Giving the Wounded a Hand Up

One of the most significant injuries from war is limb amputation. Including civilian needs, there are approximately 500,000 amputations in the United States annually, with an upper-to-lower limb ration of 1-to-4.



Dr. Steele teaching residents ultrasound system.

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Duke Surgery Helping Wounded Warriors

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Recent combat conflicts are only driving this number up, says **Linda Cendales, MD**, Associate Professor, Division of Plastic, Maxillofacial, and Oral Surgery, but only 30 percent, including servicemen and women, have received hand transplants. As with other organ transplants, these procedures present the same immunosuppressive and rejection issues.

This uptick led to the creation of the Duke Vascularized Composite Allotransplantation (VCA) program. With more than \$5 million in U.S. Department of Defense funding, Dr. Cendales leads this five-institution consortium to investigate how to make this therapy more effective for wounded soldiers and civilians. VCA is the transplantation of tissues, such as bone, skin, muscle, nerve, and tendon as a complete, functional unit, such as the hand.

Dr. Cendales' work, in particular, focuses on novel immunosuppressive therapy – the study of rejection – and how this work can be applied clinically. Currently, she's recruiting servicemen and women, as well as civilians, between the ages 18 and 60 who have lost one or both hands to undergo hand transplantations, and will conduct initial and follow-up procedures.

"Hand transplantation is a high-risk, high-reward quality of life transplant," she says. "There are more unknowns than knowns with VCA, and it will be centers, like Duke, that will provide scientific insight not only into VCA, but also to other fields that pair with VCA, including immunology and transplantation neurosciences, and psychosocial sciences."

Dr. Cendales and her multidisciplinary team use a bench-to-bedside approach with a model they created by working with non-human primates. Specifically, they're testing regimens that block a certain pathway in the immune response to VCA allografts, evaluating whether the regimens prevent rejection and prolong transplanted tissue survival. Their findings will improve care for patients undergoing hand transplantation at Duke, she says.

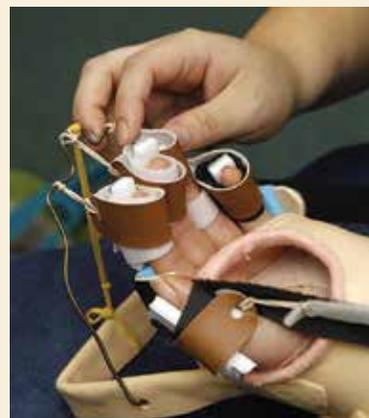
Overall, although these endeavors assist soldiers and civilians in different ways and locations, all are designed to maximize the level of health care available to individuals who suffer some of the most extensive, life-altering injuries.

"Over the last decade, with our influx of critically-injured soldiers, we've decided to take on and turn out new initiatives that will help those coming back from the front lines," Dr. Kirk says.

Duke Establishes First Hand Transplant Program in North Carolina

Duke Medicine has launched the first hand transplant program in North Carolina, becoming one of a small number of transplant centers in the country to offer the life-altering procedure.

The Duke Hand Transplant Program is part of a clinical trial to determine the safety and efficacy of hand transplantation for patients who have lost a limb(s) below the elbow. The trial will also test the effectiveness of a new drug, belatacept, in preventing rejection of the transplanted hand.



"People who have lost one or both hands face significant challenges in daily life," says **Linda Cendales, MD**, Associate Professor, Division of Plastic, Maxillofacial and Oral Surgery. Dr. Cendales heads Duke's Hand Transplant Program and has been a leader in the field of Vascularized Composite

Allotransplantation, or VCA. "It's difficult to perform activities of daily living and routine tasks that most of us take for granted. Hand transplantation improves quality of life."

Dr. Cendales joined Duke Surgery in 2014 from Emory University, where she served as the director of the VCA program and the Laboratory of Microsurgery. She also trained at the Christine M. Kleinert Institute for Hand and Microsurgery in Louisville, Kentucky, where she helped establish the first hand transplant program in the country, and helped performed the first two cases in the United States in 1999 and in 2001.

Fewer than 20 centers in the United States offer hand transplantation. The surgery is highly complex, involving an intricate process of connecting bone, blood vessels, muscle, nerve, tendons, and skin. Matching the limb from a deceased donor is also a complex process, adding to the rarity of the procedure.

"Currently, fewer than 150 people have received hand transplants in the world," Dr. Cendales says. "We look forward to offering this option to our patients and serve our community as part of Duke's tradition of innovation and outstanding patient care."

The Duke Hand Transplant Program is open to individuals from 18-60 years old, including military service members, who have lost one or both hands. For more information contact Dr. Cendales at 919-684-8661.

Can a Modified Poliovirus Fight Advanced Prostate Cancer Too?

Duke researchers made a big splash in the news last spring when 60 Minutes featured the success of early clinical trials using a modified poliovirus in the fight against a deadly form of brain cancer. Now, with funding from the Duke Clinical and Translational Science Award (CTSA) through the Duke Translational Research Institute (DTRI) Collaborative Pilot Award, an interdisciplinary team of researchers is on the path to apply this promising new therapy, known as PVSRIPO, in patients with incurable metastatic prostate cancer.

“The idea is that we have some success in brain tumor—now how do you move it into a non-central nervous system indication?” asks principal investigator, **Smita Nair, PhD**, Associate Professor, Division of Surgical Sciences and Director of the Immunotherapy Sciences Focus Group at the Duke Cancer Institute.

Survival rates for people with prostate cancer are excellent if doctors find the tumor early, before the cancer has spread or when it has spread only to nearby areas of the body. Once prostate cancer reaches distant locations, including lymph nodes, bones, or other organs, the outlook is grim. According to the American Cancer Society, the five-year survival in the case of advanced, metastatic diseases is just 28 percent.

With no hope for a cure, doctors attempt to manage the cancer and delay patients’ deterioration with a long line of hormonal therapies, chemotherapies, and radiation, explains Dan George, MD, a medical oncologist in the Duke Department of Medicine specializing in urologic cancers and a co-investigator on the new CTSA-supported poliovirus work.

“We desperately need new therapies to alter the course,” he says.

More Than a Cancer Killer

Drs. Nair and George, along with colleagues including cancer biologist and virologist and inventor of the oncolytic poliovirus, PVSRIPO, **Matthias Gromeier, MD**, Associate Professor, Department of Neurosurgery and **Brant Inman, MD**, Associate Professor, Division of Urology, think that one of those new therapies might just be poliovirus. PVSRIPO has been modified and tamed with the addition of a rhinovirus, the virus responsible for the common cold. The engineered virus specifically targets and destroys tumor cells while leaving healthy cells unscathed.

But the virus’s destruction of cancer cells alone doesn’t explain the long-term response they’ve seen in some patients with brain tumors.

“At first the thinking was that the virus is killing tumor cells,” Dr. Nair says. “But there may be more happening.”

Investigating that question about what else is happening is how Dr. Nair got involved in the poliovirus work in the first place. She is an expert in the field of cancer vaccines and immunotherapies, treatments designed to enlist the immune system in the fight against the disease. The Duke researchers now suspect tumors infected

with poliovirus spew out proteins and other bits as they die, revving up the immune system and training it to fight the cancer in the event that it recurs locally or spreads.

Finding a treatment that combines destruction of tumors and immunotherapy for prostate cancer would be an exciting advance in medicine. In fact, prostate cancer is the only tumor type for which there is an FDA-approved tumor vaccine. The vaccine, called Provenge, doesn’t cure prostate cancer, but it does train the immune system to help control it in some patients who have stopped responding to hormonal therapy.

Drs. Nair and George have been interested in immunotherapies for prostate cancer for many years. This current research aims to discover whether PVSRIPO might offer a new form of immunotherapeutic cancer treatment for previously incurable prostate cancer.

The first step for Drs. Nair and George and their colleagues is to test their hunch about PVSRIPO and its effects on the immune system in laboratory mice. Those studies involve mice with a fully functioning immune system that have been modified to express the poliovirus receptor (poliovirus normally isn’t capable of infecting mouse cells). They’ll be looking for signs that the PVSRIPO not only kills cancer cells, but that it also initiates immune events in the process that are capable of eliminating recurrent and metastatic disease.

Looking Ahead

Meanwhile, the team is preparing for a future clinical trial of the poliovirus treatment in patients with prostate cancer so that they can move quickly when the DTRI-funded results from the mouse studies and the needed funding for a new trial come in. They say that the ongoing studies in animals and future trials in prostate cancer will also help researchers to understand how the treatment works in patients with brain tumors. Those insights may help to improve the treatment and to explain why some patients respond to the poliovirus so well and others don’t.

“This is why we’re at Duke,” Dr. George says. “This is the kind of work that can change a field and move a field in a direction it wasn’t previously going in, and that’s incredibly exciting for us as investigators. We’ve seen those long-term remissions in patients with brain cancer. In our prostate cancer patients, we’ll be looking and hoping for that same kind of response.”



Drs. Smita Nair and Daniel George

Poke-Proof Grafts Could be Life-Changing for Dialysis Patients

People with end-stage kidney failure depend for their very life on connecting their bloodstream to a dialysis machine several times a week. Each time, all of the blood is pumped out of the body and into a blood-cleansing machine that filters the blood before circulating it back into their body over a period of about four hours. The success of this life-saving procedure depends on a hollow tube implanted under the skin—an arteriovenous graft—which provides ready access to the bloodstream.

But, as **Roberto Manson, MD**, Assistant Professor, Division of Vascular Surgery explains, the hollow tube that allows the procedure has a big problem - needle pokes.

The problem with standard grafts is that manufacturers make them primarily to ensure a strong blood flow through the conduit. They aren't made to withstand the regular needle pokes that dialysis requires. It's very easy for dialysis professionals to inadvertently poke the needle straight through one side of the graft and out the other. As a result, patients on dialysis often suffer painful bruising and infections from arteriovenous graft injuries and related complications.

After studying the problem, Dr. Manson and his teammates have an answer: poke-proof grafts with self-sealing capabilities.

With funding from the Duke Clinical and Translational Science Award (CTSA) through the Duke Translational Research Institute (DTRI) Collaborative Pilot Award, Dr. Manson, **Jeffrey Lawson, MD**, Professor, Division of Vascular Surgery, and senior vascular physician assistant **Shawn Gage, PA-C**, aim to get this game-changing medical device out to patients within a year. Gage, co-inventor and lead developer of the technology, has been working with a local engineering and design firm, Gilero Biomedical, to conceptualize and create this immediate use, error proof, dialysis graft.

Dr. Lawson and Shawn Gage spend a good part of their time in the operating room implanting new grafts and correcting those that have failed. In a conference room on the fourth floor of Duke's Medical Sciences Research Building, Dr. Lawson flips through a series of gruesome images on his computer screen that illustrate just how miserable graft failures are for kidney disease patients. It's also costly. Arteriovenous graft injuries and complications are responsible for millions of dollars in health care expenditures every year.

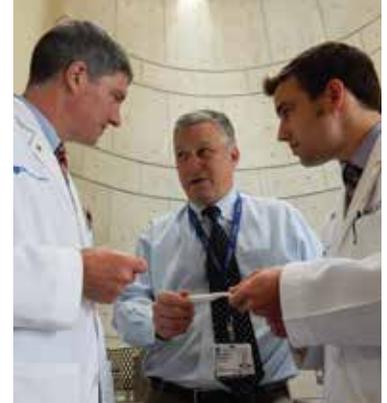
"It costs \$50,000 every time this happens," Dr. Lawson says. "It's expensive, painful, and I think unnecessary."

That line of thinking has led Dr. Lawson and others to search for solutions. "That's the nature of invention," Dr. Lawson says. "You get sick of something failing over and over again and you think there has to be a better way to do this."

Lawson, Manson, and Gage, appear to have found that better way.

Their device, called **Bullet Proof™**, is surprisingly simple. Over most of its length, their new graft is identical to those that are standardly used. But Bullet Proof has two penetration-resistant chambers—one for the needle that sends blood out of the body and

the other for the needle that sends the blood back in again—each built with a window of material that seals itself after each needle poke. Along the back of the tube is a rigid plate that makes it impossible for a needle to go straight through the graft. Dr. Lawson likes to illustrate this by pushing a needle in and showing how it bends rather than poking through.



Lawson, Manson and Gage hold the latest prototype of the Bullet Proof graft.

The Duke team has already fabricated simple prototypes of their new device and launched a company called InnAVasc with the goal to develop their graft into a marketable product. With funding from the Duke CTSA through the Duke DTRI Collaborative Pilot Award, they are working to finalize their device design and conduct tests of Bullet Proof to further demonstrate the puncture resistant and self-sealing capabilities in the laboratory.

The investigators are implanting the grafts into pigs to see how well they really work in a living, breathing animal. After a poke of a standard graft, there is considerable bleeding. Dialysis professionals typically must apply pressure for some time before the bleeding stops. In animal tests, it appears as though Bullet Proof grafts result in little more than a trickle of blood as their walls seal themselves back up. As a result, the tissue around a Bullet Proof graft doesn't show the inflammation and injury that's typical in dialysis patients today.

The Bullet Proof concept and device is getting great reviews. In April, the Duke team won the CX Innovation Showcase held in London, which is dedicated to vascular and endovascular innovation. Drs. Manson and Lawson say they've already spoken with the FDA and are working on a package to present to them in hopes of testing the new device in patients as soon as possible. If they can secure enough funding to proceed to a final, medical-grade product, they hope to begin implanting the first Bullet Proof grafts into people within a year.

That's promising news for dialysis patients and for the doctors and nurses who care for them. Shawn Gage says that Bullet Proof might even enable some patients to begin undergoing dialysis in the comfort of their own homes.

"We think this can save the health system money and patients from misery," Dr. Lawson says. "The idea just makes common sense and the DTRI award is important in providing financial support to push it forward."

Lymph Nodes Signal More Aggressive Thyroid Cancer Even in Young Patients

Patients older than age 45 with thyroid cancer that has spread to neck lymph nodes have long been considered at higher risk of dying, but the same has not been true for younger patients.

Now researchers at the Duke Cancer Institute and the Duke Clinical Research Institute have found that younger thyroid cancer patients with lymph node involvement are also at increased risk of dying, contrary to current beliefs and staging prognostic tools that classify young patients as having low-risk disease.

The finding, published this week in the *Journal of Clinical Oncology*, comes at a time when the American Joint Committee on Cancer is working to revise the staging criteria for all cancers, including thyroid cancer, which is the fastest-increasing malignancy among both men and women in the U.S.

“The staging system for thyroid cancer is very idiosyncratic, in that there are two different patterns of staging based on whether the patient is over 45 years old or under 45,” says **Julie Ann Sosa, MD**, Professor, Division of Advanced Oncologic and GI Surgery, and senior author of the study. “This is the only cancer where age is such an important component of the staging system.”

Dr. Sosa says the current system classifies cancers in four stages among patients over the age of 45, with Stage 1 patients having the best prognosis and Stage 4 having the worst. For patients under 45, there are currently only two stages, and both are typically associated with favorable overall prognoses.

Dr. Sosa and her colleagues say they sought to explore whether the current staging system accurately reflects the impact of lymph node involvement on survival in younger patients. Two previous studies suggested that lymph involvement was not prognostically relevant to those under 45, but those studies had multiple shortcomings.

In their analysis, the Duke researchers examined nearly 70,000 patient outcomes reported in two large government data sources – the National Cancer Data Base and the SEER database.

They found that when cancer spread to the lymph nodes in the neck, younger patients had a lower survival rate compared to patients with no spread to the lymph nodes. This risk was similar to that of older patients. What’s more, the number of lymph nodes that were involved played a role in survival. When just one node was cancerous, the survival risk was better, but if six or more nodes were cancerous, the survival was clearly compromised.

“This becomes an issue of the burden of disease,” Dr. Sosa says. “The number of lymph nodes involved makes a difference, but only up to a point. Six lymph nodes appear to be a critical number

– anything more than that does not really add to the increased risk of death.”

Dr. Sosa says the findings have immediate and potentially practice-changing implications. She says the study raises the question of whether the current staging system should be revised for younger thyroid cancer patients to better reflect their actual prognosis.

Additionally, she noted, the finding suggests that doctors might need to conduct more rigorous imaging and biopsy analysis before surgery to determine whether more lymph nodes should potentially be removed.

“All surgery comes with risk, so we only want to expose patients to those risks if they have attendant benefits,” Dr. Sosa says. “Knowing that lymph node involvement in younger patients does carry a survival risk, doing a more extensive surgery might be warranted.”

In addition to Dr. Sosa, study authors include Mohamed Abdelgadir Adam, John Pura, Paolo Goffredo, Michaela A. Dinan, Shelby D. Reed, Randall P. Scheri, Terry Hyslop, and Sanziana A. Roman.

The study was supported by the Duke Cancer Institute and the Duke Clinical Research Institute.



Julie Ann Sosa, MD

SURGERY RESEARCH GRANT ACTIVITY

Basic and Translational Research

Frank DeRuyter, PhD, Professor and Section Chief, Speech and Audiology Section in the Division of Head and Neck Surgery and Communication Sciences, was awarded a grant from the Department of Education for "LiveWell RERC."

Scott T. Hollenbeck, MD, Associate Professor, Division of Plastic, Maxillofacial, and Oral Surgery, was awarded a grant from the Southeastern Society of Plastic and Reconstructive Surgeons for "Nanoplatfrom for Tracking Adipose-Derived Stem Cell Migration."

Allan D. Kirk, MD, PhD, Professor and Chair, Department of Surgery, was awarded a grant from the National Institutes of Health for "Neonatal Porcine Islet Xenografts for the Treatment of Type 1 Diabetes."

Jean Kwun, PhD, Assistant Professor, Division of Abdominal Transplant Surgery, was awarded the Mid-Atlantic Affiliate MAA Winter 2015 Scientist Development Grant from the American Heart Association for "Prevention of Homograft Induced Cardiac Allograft Vasculopathy in Pediatric Heart Transplantation."

Walter T. Lee, MD, Associate Professor, Division of Head and Neck Surgery and Communication Sciences, was awarded a grant from the American Medical Association Foundation for "TERT Promoter Mutation Frequency in Subsets of Oral Tongue Cancer Patients."

Jeffrey R. Marks, PhD, Associate Professor, Division of Surgical Sciences, was awarded a grant from the National Institutes of Health for "Atlantic Breast and Gynecologic Clinical Validation Center."

Carmelo A. Milano, MD, Professor, Division of Cardiovascular and Thoracic Surgery, was awarded a grant from HeartWare, Inc. for "A Prospective Pilot Study to Examine the Involvement of apoE Gene Variants in Intracranial Hemorrhage in LVAD Patients."

J. Todd Purves, MD, PhD, Associate Professor, Division of Urology, was awarded a grant from the National Institutes of Health for "Inflammasomes Mediate Inflammation in Bladder Outlet Obstruction."

Julie A. Sosa, MD, Professor and Chief, Section of Endocrine Surgery in the Division of Advanced Oncologic and Gastrointestinal Surgery, was awarded a grant from the National Institutes of Health for "Single Cell Analysis of Intratumoral Heterogeneity in Parathyroid Neoplasia."

Bruce A. Sullenger, PhD, Professor, Division of Surgical Sciences, was awarded a grant from the National Institutes of Health for "Antithrombotic Aptamers and Antidotes."

Kent J. Weinhold, PhD, Professor and Chief, Division of Surgical Sciences, was awarded a grant from the National Institutes of Health for "Centers for AIDS Research (CFAR)."

John S. Yi, PhD, Assistant Professor, Division of Surgical Sciences, was awarded a grant from the Myasthenia Gravis Foundation of Illinois for "Profiling of ACHR-Specific B Cells in Myasthenia Gravis."

Clinical Trials

Charles J. Gerardo, MD, Associate Professor, Division of Emergency Medicine, was awarded a grant from PSI CRO US for "Efficacy and Safety of Eravacycline Compared with Levofloxacin in Complicated Urinary Tract Infections."

G. Charles Hughes, MD, Associate Professor, Division of Cardiovascular and Thoracic Surgery, was awarded a grant from the Sorin Group for "Mitroflow Aortic Pericardial Heart Valve with Phospholipid Reduction Treatment."

Howard Levinson, MD, Associate Professor, Division of Plastic, Maxillofacial, and Oral Surgery, was awarded a grant from KCI USA, Inc. for "Management of Closed Surgical Incisions Using the PIMS Customizable Dressing."

Alexander T. Limkakeng Jr., MD, Associate Professor, Division of Emergency Medicine, was awarded a grant from Nanomix, Inc. for "A Performance Evaluation of the Nanomix eLab Troponin I Assay with the Nanomix eLab System." Additionally, Dr. Limkakeng was awarded a grant from the Hospital Quality Foundation for "Utilization of Ticagrelor in the Upstream Setting."

Michael E. Lipkin, MD, Associate Professor, Division of Urology, was awarded a grant from Allena Pharmaceuticals for "Study to Evaluate Multiple Doses of ALLN-177 in Recurrent Calcium Oxalate Kidney Stone."

Andrew J. Lodge, MD, Associate Professor, Division of Cardiovascular and Thoracic Surgery, was awarded a grant from CorMatrix for "CorMatrix® ECM® Tricuspid Valve Replacement Safety and Early Feasibility Study."

Richard L. McCann, MD, Professor, Division of Vascular Surgery, was awarded a grant from Cook, Inc. for the "Zenith p-Branch Pivotal Study."

Carmelo A. Milano, MD, Professor, Division of Cardiovascular and Thoracic Surgery, was awarded a grant from Abiomed for "Impella RP Support Systems in Patients with Right Heart Failure."

Jacob N. Schroder, MD, Assistant Professor, Division of Cardiovascular and Thoracic Surgery, was awarded a grant from TransMedics for the "EXPAND Heart Trial."

Cynthia K. Shortell, MD, Professor and Chief, Division of Vascular Surgery, was awarded a grant from Endologix, Inc. for "Assess Outcomes of Patients Treated with the AFX System (LEOPARD)."

For an up-to-date listing of Duke Surgery research, visit surgery.duke.edu/research.

Surgery Publications in High Impact Factor Journals

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Duke Surgery and Durham Nativity School Partner Up to Train Future Surgeons



Durham Nativity School students suture a swine paw



A student wraps a suture around a needle holder to learn how to tie knots



Dr. Linda Cendales instructs the students on the proper suturing technique

Students from the Durham Nativity School recently participated in a unique, hands-on surgical skills workshop as part of a new educational outreach program from the Duke Department of Surgery.

The Academic Success Through Surgical Education and Training (ASSET) program aims to foster high achievement in science through surgical education for financially disadvantaged students at the Nativity School.

“There is exceptional talent shrouded in poverty,” says **Linda Cendales, MD**, Associate Professor, Division of Plastic, Maxillofacial, and Oral Surgery, and one of the program leaders. “We will all benefit if we can lift that shroud and expose the talent. Duke Surgery is internationally recognized as one of the leading surgery programs worldwide. We are also here to serve our community. Serving our community in this way is one of the things that grounds us.”

Founded in 2002 by former Chief of Trauma Surgery Dr. Joseph Moylan, the Durham Nativity School is a tuition-free middle school for boys from low-income families in the local community. Dr. Moylan established the school to enable underprivileged boys to achieve academic excellence through a robust, comprehensive 11-year educational program beginning in middle school through the completion of college. As a result of this program, 82% of Nativity School graduates attend college.

The Duke Department of Surgery has partnered with the Nativity School in providing career mentorship and educational assistance to nurture the students’ intellectual curiosity and to prepare them for medical school, residency, and beyond. One aspect of the ASSET program focuses on empowerment, modeling and career orientation, while another aspect offers anatomy, simulation, and surgical workshops for the students.

Anatomy and Surgical Skills Workshop

The first Anatomy and Surgical Skills workshop was held September 30 in an operating room in the vivarium on Duke’s medical research campus. Students learned about the rigorous hygiene practices that surgeons undergo to prepare for surgery, including scrubbing in, surgical gowning, gloving, and applying the surgical mask, shoe covers, and cap, followed by the proper handling of surgical instruments.

Using swine paws, the students received instruction on the correct techniques for making incisions into the skin with a scalpel, suturing the incisions with a suture needle and thread, and tying surgical knots. The students then took turns suturing the skin while an instructor provided guidance. The students quickly learned the suturing technique, and at one point, several students began timing each other in a competition for the fastest muscle repair.

Following the suturing skills session, the instructors dissected the paws to teach the students about the anatomical structure of the paw. Definitely the highlight of the workshop, the dissection session was peppered with emphatic “whoa’s” from the students when they discovered a new, fascinating part of the anatomy, such as how the muscle connects to the tendon and moves a joint.

“It is much more meaningful to them to pull on a tendon and see it work than to look at a diagram or listen to a description,” says Mary Anderson, the student’s science teacher.

“The students got to experience a true laboratory setting and were able to work with materials not available to us normally. The expertise of the surgeons leading the groups and the excellent instructor-to-student ratio also cannot be replicated at school. It was a wonderful first experience with dissecting that will enhance their ability to learn from later dissections at school.”

In addition to surgery and anatomy, the students will learn about biologic systems, such as the cardiac system, at the Duke simulation lab where surgical residents undergo training. The second surgical skills workshop is currently planned for 2016.

“Each morning the young men of Durham Nativity School recite a creed that begins, ‘As DNS Men, we will... Dare to Dream Big,’” says Dan Vannelle, Head of the Durham Nativity School.

“The mission of our school is to prepare and position these young men to fulfill their biggest dreams. Spending a day experiencing the ASSET workshop fueled dreams and opened the eyes of our young men to the real possibility of one day becoming a surgeon. We are grateful to Duke Surgery for investing in and making a difference in the lives of these young men.”

To learn more about the Durham Nativity School, please visit the school’s website at <http://www.durhamnativity.org>.

NEW FACULTY



Renee L. Boyd, MD

Division of Emergency Medicine

Clinical interests include traumatic brain injury (TBI) and methicillin-resistant *Staphylococcus aureus* (MRSA).
919-684-5537



Ellen D. Dillavou, MD, RPVI

Division of Vascular Surgery

Clinical interests include the creation of a system-wide dialysis access center and caring for patients with venous disease. Research interests include the assessment of wound healing rates, arteriovenous fistula (AVF) complications, access outcome in the morbidly obese, and assessment and efficacy of various methods of perforator closure.
919-470-7000



Laura Lazarus, MD

Division of Advanced Oncologic and Gastrointestinal Surgery

Clinical interests include diagnosis and treatment of breast cancer, management of patients at high risk for breast cancer, and surgical treatment of patients with breast disease.
919-782-8200



Erin Leiman, MD

Division of Emergency Medicine

Clinical interests include resident education, simulation training, and the practice of emergency medicine.
919-684-5537



David A. Michaels, MD

Division of Emergency Medicine

Clinical interests include infectious disease and antibiotic stewardship, and maximizing the efficient use of resources.
919-681-8521



Harvey G. Moore, MD

Division of Advanced Oncologic and Gastrointestinal Surgery

Clinical interests include benign and malignant colorectal disease, particularly the multimodality treatment of locally advanced rectal cancer. Research interests have centered around colorectal cancer, including the predictors and modifiers of response of rectal cancer to preoperative multimodality therapy.
919-681-3977



Michael O'Keefe, MD

Division of Emergency Medicine

Clinical interests include ultrasonography, resident and medical student education, obtaining challenging vascular access, critical illness diagnosis and management, and neurology with an emphasis on acute stroke diagnosis and management.
919-681-0196



J. Todd Purves, MD, PhD

Division of Urology

Clinical interests include pediatric urology with a focus on treating children with congenital defects and illnesses that involve the kidney, bladder, and genitalia. Research interests include studying the role of inflammation in urinary problems caused by infection (UTI), spinal cord defects or injury, diabetes, or obstruction.
919-681-5507



Daniel J. Rocke, MD, JD

Division of Head and Neck Surgery and Communication Sciences

Clinical interests include treating cancers of the head and neck with the goal of treating the whole patient and not just focusing on the problem of the cancer. Research interests include exploring how patients and their family members make end-of-life decisions and exploring issues surrounding informed consent for surgical procedures.
919-862-5730



Keri A. Seymour, DO

Division of Metabolic and Weight Loss Surgery

Clinical interests include gastrointestinal surgery with a focus on gallbladder and gastric disease, reflux disease, and hernias; working with patients to decide the best treatment for weight loss that will resolve diseases, such as diabetes and hypertension.
919-862-2715 (Raleigh)
919-470-7000 (Durham)



John H. Stewart IV, MD, MBA

Division of Advanced Oncologic and Gastrointestinal Surgery

Clinical interests include general surgical oncology with a focus on melanoma as well as gastrointestinal and peritoneal surface malignancies.
919-684-6858



Cory J. Vatsaas, MD

Division of Trauma, Critical Care, and Acute Care Surgery

Clinical interests include trauma, acute care surgery, acute respiratory distress syndrome (ARDS) treatment, transfusion in trauma and critical care, small bowel obstruction interventions, protocol and guideline development, and medical education.
919-684-3636



Brian Whitley, MD

Division of Urology

Clinical interests include the practice of general urology with a focus on medical and surgical treatment of benign prostatic hyperplasia (BPH) and kidney stones, and management of male hypogonadism and sexual dysfunction.
919-684-8111

FACULTY PROMOTIONS



Seth M. Cohen, MD, MPH
*Division of Head and Neck Surgery and
Communication Sciences*
Promoted to Associate Professor



Jonathan C. Routh, MD, MPH
Division of Urology
Promoted to Associate Professor



Christopher Mantyh, MD
Division of Advanced Oncologic and GI Surgery
Promoted to Professor



Kevin Saunders, PhD
Division of Surgical Sciences
Promoted to Assistant Professor



Takuya Osada, MD, PhD
Division of Surgical Sciences - Applied Therapeutics
Promoted to Associate Professor



Randall P. Scheri, MD
Division of Advanced Oncologic and GI Surgery
Promoted to Associate Professor



Erin G. Piker, PhD
*Division of Head and Neck Surgery and
Communication Sciences*
Promoted to Assistant Professor



Betty C. Tong, MD, MHS, MS
Division of Cardiovascular and Thoracic Surgery
Promoted to Associate Professor



Eileen M. Raynor, MD
*Division of Head and Neck Surgery and
Communication Sciences*
Promoted to Associate Professor

DUKE NEWS AND HONORS

U.S. News ranks DUHS hospitals among national, state, local leaders



Duke University Hospital (DUH) again is included on the Honor Roll of top hospitals in the nation by U.S. News & World Report. Duke ranks Number 14 in the magazine's 2015-16 listings.

DUH was ranked number 1 in North Carolina and number 1 in the Raleigh-Durham area. In addition, Duke Regional Hospital and Duke Raleigh Hospital were ranked eighth and twelfth, respectively, in North Carolina, and third and fifth in the Raleigh-Durham area. Of note is that Duke Regional was ranked ahead of both Rex Hospital and WakeMed Hospitals in both the state and the Raleigh-Durham area. Duke Raleigh Hospital was ranked ahead of WakeMed Hospitals in both the state and the Raleigh-Durham area.

Honor Roll designations were awarded to just 15 hospitals out of nearly 5,000 evaluated by U.S. News for its rankings. Hospitals on the exclusive list achieved high scores in at least six of the 16 medical specialties that form the basis of the magazine's survey.

Among specialties receiving top scores at Duke were cardiology and heart surgery (6th), pulmonology (7th), ophthalmology (8th), urology (9th), rheumatology (12th) and nephrology (17th).

Duke University Hospital is ranked nationally in another six adult specialties (cancer, diabetes/endocrinology, geriatrics, gynecology, neurology/neurosurgery, orthopedics), along with eight pediatric specialties (cancer, cardiology/heart surgery, diabetes/endocrinology, gastroenterology/GI surgery, neonatology, nephrology, pulmonology and urology). It was also high-performing in one adult specialty (gastroenterology/GI surgery).

Duke Regional was ranked "high performing" in four specialties: diabetes and endocrinology, geriatrics, pulmonology and urology. Duke Raleigh was ranked "high performing" in nephrology and orthopedics.

Duke Children's Hospital listed among nation's best by US News

U.S. News & World Report has included Duke Children's Hospital and Health Center in its 2015-16 list of the nation's best children's hospitals.

Duke Children's was ranked among the top 50 nationally in eight areas of specialty, including cancer, cardiology and heart surgery, diabetes and endocrinology, gastroenterology and GI surgery, neonatology, nephrology, pulmonology and urology.

Duke PA Program Ranked Number One in Country

Duke University's Physician Assistant (PA) Program ranked number one among PA programs in the country, according to new U.S. News & World Report graduate and professional school rankings released on March 10, 2015.

The birthplace of the PA program, Duke welcomed its first class of three PAs in 1965. The program was developed by Dr. Eugene Stead, former chairman of the Department of Medicine, who believed that mid-level practitioners could increase consumer access to health services by extending the time and skills of the physician. Today, physician assistants are well-recognized and highly sought-after members of the health care team. Working interdependently with physicians, PAs provide diagnostic and therapeutic patient care in virtually all medical specialties and settings.



Duke Surgery Announcements and Honors



Duke Surgery's Accreditation Education Institute was recently awarded reaccreditation as an American College of Surgeons Comprehensive Education Institute. Accreditation is for a period of three years. In order to maintain accreditation, each institute must apply for reaccreditation at the end of their three-year accreditation period.



Mitchell Cox, MD, Associate Professor, Division of Vascular Surgery, received the Duke 2015 Practice Course Professionalism Award. Second-year medical students in the Practice Course nominate faculty who demonstrate exceptional professional behavior in the clinical setting.



Thomas A. D'Amico, MD, Professor, Division of Cardiovascular and Thoracic Surgery and **Betty Tong, MD**, Associate Professor, Division of Cardiovascular and Thoracic Surgery, were elected to the Editorial Board of The Journal of Cardiovascular and Thoracic Surgery.



David C. Gordon, MD, Associate Professor, Division of Emergency Medicine, was announced as president-elect of Clerkship Directors in Emergency Medicine (CDEM). Dr. Gordon was also recently a recipient of the American College of Emergency Physician's (ACEP) National Faculty Teaching Award.



Brant Inman, MD, Associate Professor, Division of Urology, was awarded the 2014 International Journal of Hyperthermia Editor's award for best paper by a junior investigator, in the Clinical category.



Aaron Lentz, MD, Assistant Professor, Division of Urology, was presented with an award for excellent work and commitment to best practices for their presentation on "Inventory Management" at the PDC Joint DMAIC (Define, Measure, Analyze, Improve, Control) meeting in September.



Howard Levinson, MD, Associate Professor, Division of Plastic, Maxillofacial, and Oral Surgery, was nominated as Chair-Elect of the Plastic Surgery Research Council. **Scott Hollenbeck, MD**, Associate Professor, Division of Plastic, Maxillofacial, and Oral Surgery, will also serve as the Parliamentarian of the council.



Dana Portenier, MD, Assistant Professor, Division of Metabolic and Weight Loss Surgery, was promoted to Division Chief.



Mark Shapiro, MD, Associate Professor, Division of Trauma, Critical Care and Acute Care Surgery was elected to a 6-year term as Chairman of the North Carolina Committee on Trauma.



Julie A. Sosa, MD, Professor, Division of Advanced Oncologic and GI Surgery, was accepted as a Fellow in the 2015-2016 Class of the Hedwig van Ameringen Executive Leadership in Academic Medicine (ELAM) Program for Women.



Ranjan Sudan, MD, Associate Professor, Division of Metabolic and Weight Loss Surgery, was elected to a 3-year term as a Member of the Executive Council of the American Society for Metabolic and Bariatric Surgery.



Brianne Steele, MD, Assistant Professor, Division of Emergency Medicine, received her Registered Diagnostic Medical Sonographer (RDMS) certification with an Abdomen (AB) specialty. Dr. Steele directs Duke Surgery's ultrasound program, which provides point-of-care "bedside" ultrasound scans to acutely ill patients in the emergency department.



Julie Thacker, MD, Assistant Professor, Division of Advanced Oncologic and GI Surgery, assumed the role of Medical Director for the Surgery Clinical Research Unit effective July 1. Dr. Thacker has been serving as the Assistant Medical Director of the CRU, is an excellent champion for clinical research and is very well suited for this new, increasing responsibility.



Elisabeth T. Tracy, MD, was appointed Associate Program Director of the General Surgery Residency Program.

Duke Surgery CME Courses

Duke Surgery is dedicated to training surgeons using the latest surgical techniques and innovative approaches in minimally invasive surgery. Utilizing a combination of didactic lectures, live surgeries, video, and hands-on labs in minimally invasive surgical techniques, hundreds of surgeons and allied health professionals from around the world have been trained at Duke. CME credit is available for a number of courses held throughout the year in a wide range of surgical specialties. Following are upcoming Duke Surgery CME courses. For a complete list of Duke Surgery educational initiatives, visit surgery.duke.edu/education.

Duke Urologic Assembly & Duke Urologic Cancer Symposium



March 31–April 3, 2016
Omini Hilton Head
Hilton Head, SC

Duke Masters of Minimally Invasive Bariatric Surgery



May 5–7, 2016
JW Marriott
Orlando, FL

Duke Masters of Minimally Invasive Thoracic Surgery



September 15–17, 2016
Waldorf Astoria
Orlando, FL

Sabiston Surgical Society

The Sabiston Surgical Society held their annual meeting July 9–11, 2015 at Duke. This prestigious surgical society was founded in 1983 in honor of the legendary **David C. Sabiston, Jr., MD**, who served as Chairman of the Duke Department of Surgery for over 30 years.



2015 Sabiston Surgical Society meeting attendees included:

Left to Right: 1st row: Steve Eubanks, Brian Clary, Richard McCann, Michael DiMaio, Allan Kirk, Robert Anderson, Art Ross, Earle Austin, John Grant, Ralph Damiano

2nd row: Harmuth Bitter, Aurora Pryor, Cemil Purut, Rebekkah White, Paul Mosco, Andy Davidoff, John Hanks, John Hammon, Thomas D'Amico, Shelly Huang, Peter Smith, Steve Hannish, Jennifer Aldrink, Elizabeth Tracy, Joseph Elbeery, Andrew Lodge

3rd row: Jeff Heinle, William Meyer, Theodore Pappas, Frank Rotolo, Walter Wolfe, Francis Duhay, Douglas Reintgen, David Mahvi, Jeffrey Lawson, George Leight, Phillip Shaddock, Rolf Barth, Chris Waters, Stan Gall

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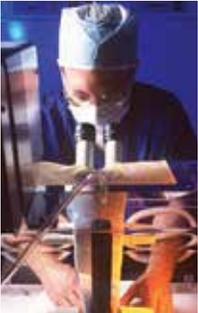
Mission

Through sustainable, multidisciplinary teams Duke Surgery will:

- Provide insight regarding the fundamental nature of patient health and disease
- Empower all patients, trainees, and colleagues with knowledge
- Provide safe and high quality care based on an advanced understanding of and respect for our patients' needs and guided by best practices

Vision

Duke Surgery: United, for *All* Patients



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