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

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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.
**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 Estamaldo serves as the Division Chief of HNCS, and Dr. Frank DeRuyter serves as the Section Chief for the Speech and Audiology section within HNCS.

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 Lawton’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 Nancy 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 vasculoplastic and allotransplantation. This program is currently recruiting patients, both service men and women.

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
Chair
Duke Department of Surgery

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**Duke Surgery Helping Wounded Warriors**

*Continued from page 1*

*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 Trauma 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 Duke 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.”

*Giving the Wounded a Hand Up*

One of the most significant injuries from war is limb amputation. Alongside learning how ultrasound works in the simulation lab, participants also learn 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 experiences here, 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.”

*Continued on page 4*
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Sincerely,

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

Duke Surgery Helping Wounded Warriors

Continued from page 1

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“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 38-day, two-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, hone it, and apply it to their encounters. They’ve learned how to describe what they see better and better link up with medical command.”

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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 ratio of 1:4.

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Wounded Warriors

$5 million in U.S. Department of Defense funding, Dr. Cendales and other 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 service members and women, as well as civilians, between the ages 18 and 60 who have lost one or both hands to undergo hand transplants, and will conduct initial and follow-up procedures.

“Hand transplantation is a high-risk, high-reward quality of life therapy,” Dr. Cendales says. “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 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 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.

Can a Modified Poliovirus Fight Advanced Prostate Cancer Too?

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 their 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 established 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 working with our patients and 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.
Duke Surgery Helping Wounded Warriors

Continued from page 3

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.

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Can a Modified Poliovirus Fight Advanced Prostate Cancer Too?

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 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 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

The engineered virus specifically targets and destroys tumor cells bearing specific markers, 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. The engineered virus specifically targets and destroys tumor cells while leaving healthy cells unscathed.

While the virus’s destruction of cancer cells alone doesn’t explain the long-term response they’ve seen in some patients with brain tumors, the ongoing studies in animals and future trials in prostate cancer might 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.

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Drs. Smita Nair and Daniel George
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 holes.

The problem stems from the fact that grafts are manufactured to withstand the regular needle pokes that dialysis patients endure. They aren’t made to withstand the regular needle pokes that dialysis patients endure. But Bullet Proof has two penetration-resistant layers—one 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 arguing a needle in and showing how it bends rather than poking through.

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 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 Shavn 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 engineer and design firm, Gilero Biomedical, to conceptualize and create this immediate use, error-proof, dialysis graft.

Dr. Lawson and Shavn 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 ineffective graft failures are to patients. The tissue around a Bullet Proof graft doesn’t get sick of something failing over and over again and think there has to be a better way to do this.

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

Their device, called Bullet Proof®, is surprisingly simple. Over most of its length, their new graft is identical to those that are currently being used. But Bullet Proof has two penetration-resistant chambers—one for the needle that sends blood back 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 arguing a needle in and showing how it bends rather than poking through.

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The innovators 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. Dr. 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. Shavn 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.”

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

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.

“This is the only cancer where age is such an important component of the staging system,” Dr. Sosa says. 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. “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 Abdelghani-Adams, John Puca, Paolo Goffredo, Michaela A. Dvan, Shelby D. Reed, Randell F. Scher, Terry Hally and Sananza A. Roman.

The study was supported by the Duke Cancer Institute and the Duke Clinical Research Institute.
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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 stems from the fact that grafts that manufacturers make 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. They received 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 engineer and designing form, to create this immediate use, error proof, dialysis graft.

Lawson, Manson, and 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 the Duke Medical Sciences Research Building, Dr. Lawson flips through a series of gruesome images on his computer screen that illustrate just how miserable graft failures can be. Arteriovenous graft injuries and complications are responsible for millions of dollars in healthcare 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 traditionally used. But Bullet Proof has two penetration-resistant chambers—one 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 putting a needle in and showing how it bends rather than poking through.

The Duke team has already fabricated simple prototypes of their new device and launched a company called InnVasc 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 issue 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. Dr. 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 clinical trial, 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 healthcare 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 prognosis.

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 Abdelghani-Adam, John Puea, Paolo Coffredo, Michaela A. Dran, Shelby D. Reed, Randall F. Scher, Terry Hyslop, and Sarazana A. Roman.

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

Julie Ann Sosa, MD

surgery.duke.edu
A Prospective Pilot Study to Examine the Involvement of apoE Gene Inflammasomes Mediate Inflammation in Bladder Outlet Obstruction.

Charles J. Gerardo, MD, Associate Professor; Division of Emergency Medicine, was awarded a grant from FS CORD US for “Efficacy and Safety of Evarolimus Compared with Leflunomide in Complicated Ulcerative Tract Infections.”

G. Charles Hughes, MD, Associate Professor; Division of Plastic, Maxillofacial, and Oral Surgery, was awarded a grant from the Sorin Group for “Mitroflow Aortic Paravalvular Heart Valve with Phospholipid Reduction Treatments.”

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 Injuries Using the PIMS Customizable Dressing.”

Alexander T. Limkakeng Jr., MD, Associate Professor; Division of Cardiovascular and Thoracic Surgery, was awarded a grant from the National Institutes of Health for “A Performance Evaluation of the Nanomax eLab Topomin I Assay with the Nanomax eLab System.” Additionally, Dr. Limkakeng was awarded an Emergency from the Hospital Quality Foundation for “Utilization of Tiacgrepil in the Upstream Setting.”

Michael E. Lipkin, MD, Associate Professor; Division of Urology, was awarded a grant from Amlina Pharmaceuticals for “Study to Evaluate Multiple Doses of ALLN-177 in Recurrent Cystic Osmolal Kidney Stone.”

Andrew J. Lodge, MD, Associate Professor; Division of Cardiovascular and Thoracic Surgery, was awarded a grant from CorMatrix for “CorMatrix® ECMU Thruaplic 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 Peripheral Study.”

Carmelo A. Milano, MD, Professor; Division of Cardiovascular and Thoracic Surgery, was awarded a grant from HeartValve, Inc. for “A Prospective Pilot Study to Investigate the involvement of gtG Variant Intraanlinal Hemorrhage in UAD 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.”

Jolie 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 Genital and Early Feasibility Study.”

Cynthia K. Shortell, MD, Associate Professor; Division of Surgical Sciences, was awarded a grant from the National Institutes of Health for “Centers for AIDS Research (CFAR).”

Scott T. Hollenbeck, MD, Assistant Professor, Division of Abdominal Surgery in the Division of Advanced Oncologic and Gastrointestinal Surgery, was awarded a grant from Endologix, Inc. for “Assess Outcomes of Patients Treated with the AFX System (LEOPARD).”

Kent J. Weinhold, PhD, Assistant Professor, Division of Communication Sciences, was awarded a grant from the Department of Education for “LiveWell RERC.”

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Kent J. Weinhold, PhD, Assistant Professor, Division of Surgery, was awarded a grant from the National Institutes of Health for “For an up-to-date listing of Duke Surgery research, visit surgery.duke.edu/static.
Surgery Publications in High Impact Factor Journals

SURGERY RESEARCH GRANT ACTIVITY

Basic and Translational Research
Frank DeWeyter, 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 RESE.”
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 “Haptosensor 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 “Neuroanatomical IoniC xenografts for the Treatment of Type 1 Diabetes.”
Jean Kwan, PhD, Assistant Professor, Division of Abdominal Transplant Surgery, was awarded a grant from the Elder-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 Hand and Neck Surgery and Communication Sciences, was awarded a grant from the American Medical Association Foundation for “EBT Promoter Mutation Frequency in Subsets of Oral Tongue Cancer Patients.”
J. Todd Purves, MD, PhD, Professor, Division of Urology, was awarded a grant from the National Institutes of Health for “A prospective Pilot Study to Examine the involvement of apoE Gene.”
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G. Charles Hughes, MD, Associate Professor, Division of Emergency Medicine, was awarded a grant from FSU CRO US for “Efficacy and Safety of Eravacycline Compared with Levofloxacin in Complicated Urinary Tract Infections.”
HeidiGoing, PhD, 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.”
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Clinical Trials
Charles J. Gerardo, MD, Associate Professor, Division of Emergency Medicine, was awarded a grant from FSU CRO US for “Efficacy and Safety of Eravacycline Compared with Levofloxacin in Complicated Urinary Tract Infections.”
Michael E. Lipkin, MD, Associate Professor, Division of Urology, was awarded a grant from Amgen Pharmaceuticals for “Study to Evaluate Multiple Doses of ALLN-177 in Recurrent Dacurate Kidney Stones.”
Andrew J. Lodge, MD, Associate Professor, Division of Cardiovascular and Thoracic Surgery, was awarded a grant from the Zerhuni p-Branch Transcathet for “A Systematic Review.”
Carmelo A. Milano, MD, Professor, Division of Cardiovascular and Thoracic Surgery, was awarded a grant from the National Institutes of Health for “Impacts p-RF Support Systems in Patients with Right Heart Failure.”


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

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 for boys from low-income families in the local community. We are grateful to Duke Surgery for investing in and serving our community.

"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.

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 Moynihan, the Durham Nativity School is a tuition-free middle school for boys from low-income families in the local community. Dr. Moynihan 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 assistance to nurture the students’ intellectual curiosity and to achieve academic excellence through a robust, comprehensive curriculum.

Several sessions were 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 cardiovascular 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 the mission of our school is to prepare and position these young men to fulfill their biggest dreams. Spending a day with the experts, learning surgical techniques, and making a difference in the lives of these young men," says Dan Vannell, Head of the Durham Nativity School.

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To learn more about the Durham Nativity School, please visit the school’s website at http://www.durhamnativity.org.
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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 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 (10th) 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

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 independently with physicians, PAs provide diagnostic and therapeutic patient care in virtually all medical specialties and settings.
FACULTY PROMOTIONS

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

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

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

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

Eileen M. Raynor, MD
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

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

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

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

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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

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surgery.duke.edu
**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.

**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, videos, 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
Omnip Hilton Head
Hilton Head, SC

### Duke Masters of Minimally Invasive Bariatic 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.

### Save the Date for the Fall 2016 Conference

July 7–9, 2016
Durham, NC

2015 Sabiston Surgical Society meeting attendees included:

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

2nd row: Harmuth Bitter, Aurina Pryor, Camil Pout, Rebekah White, Paul Moscou, Andy Dandoff, John Hanks, John Hammon, Thomas D’Amico, Shelly Huang, Peter Smith, Steve Hannah, Jennifer Aldrink, Elizabeth Tracy, Joseph Ellowy, Andrew Luby

3rd row: Jeff Hanke, William Mayer, Theodore Pappas, Frank Rotolo, Walter Wolfe, Francis Dufay, Douglas Rentfyr, David Mahvi, Jeffrey Lawson, George Leigh, Philip Shadbuck, Rolf Barth, Chris Waters, Stan Gell

**HONORS :: AWARDS :: ACCOMPLISHMENTS**

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### Duke Urologic Assembly & Duke Urologic Cancer Symposium

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

### Duke Masters of Minimally Invasive Bariatic 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.

### Save the Date for the Fall 2016 Conference

July 7–9, 2016
Durham, NC

2015 Sabiston Surgical Society meeting attendees included:

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

2nd row: Harmuth Bitter, Aurina Pryor, Camil Pout, Rebekah White, Paul Moscou, Andy Dandoff, John Hanks, John Hammon, Thomas D’Amico, Shelly Huang, Peter Smith, Steve Hannah, Jennifer Aldrink, Elizabeth Tracy, Joseph Ellowy, Andrew Luby

3rd row: Jeff Hanke, William Mayer, Theodore Pappas, Frank Rotolo, Walter Wolfe, Francis Dufay, Douglas Rentfyr, David Mahvi, Jeffrey Lawson, George Leigh, Philip Shadbuck, Rolf Barth, Chris Waters, Stan Gell
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.

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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

Partners in Philanthropy
A gift to the Duke Department of Surgery is a gift of knowledge, discovery, and life. Every dollar is used to further our understanding of surgical medicine, to develop new techniques, technology, and treatments, and to train the surgeons and researchers of the future.

If you would like to make a philanthropic investment in Duke Surgery, visit surgery.duke.edu/gift.

For Duke Surgery appointments, call:
800-MED-DUKE (for referring physicians)
888-ASK-DUKE (for patients)
surgery.duke.edu