ENGAGED, EDUCATED, EMPOWERED

Making the Patient a Partner in Surgical Recovery

1000 PATIENT PROJECT

Tailoring Surgery to a Patient’s Unique Biological Makeup
At Duke Surgery, we continually ask ourselves, “How can we better serve our patients?” Every day, we confront healthcare challenges that impact the health of our community and the world. These challenges call for an increased focus on the individual: their personal experience as a patient and their unique biology in response to treatment and disease. To this end, we seek to improve the health of our patients by endeavoring to understand why they respond to surgery differently.

Partnering with our patients, we become stakeholders in their health, and this partnership begins when we prepare them for surgery to maximize their chances for the best outcomes. In this issue, we highlight several outcomes programs that aim to empower patients in their treatment decisions. The Perioperative Optimization for Senior Health (POSH) program is a collaboration with the Department of Medicine to improve outcomes for older patients undergoing surgery. The Enhanced Recovery After Surgery (ERAS) program aspires to improve outcomes for all patients on their surgical journey, and TransQIP, a new quality improvement program, was recently established to standardize care for transplant patients. These programs will advance our mission of providing safe and high-quality care for our patients.

With the launch of the 1000 Patient Project, the department will determine how different types of surgery affect patient health. This monumental project will collect biospecimens from 1,000 patients undergoing 14 different surgical procedures to define the biological responses to surgery. The department will also join Duke Health’s Translating Duke Health initiative to characterize immunological responses to disease, including cancer, autoimmune disease, and HIV/AIDS, and life-saving treatments, including transplantation. Both of these collaborative efforts will lead to improved therapeutics to induce optimal immune responses in patients.

In addition to novel therapeutics, new diagnostic procedures can help us treat our most at-risk patients faster. The Division of Emergency Medicine produced a low-cost ultrasound device to bring rapid diagnostic testing to a patient’s bedside. This groundbreaking technology will have wide implications for making 3D ultrasound more affordable and accessible, and will help to move our most high-risk patients into the OR faster.

Through our focus on educating the next generation of surgeons, several programs nurture medical students in their path to becoming surgeons. I am excited to announce that the Duke Surgical Education and Research Group (SERG) plans to launch a new podcast app with presentations by Duke Surgery faculty later this year.

Please enjoy the spring 2018 newsletter from the Duke Department of Surgery.

Sincerely,

Allan D. Kirk, MD, PhD, FACS
David C. Sabiston, Jr. Distinguished Professor and Chairman
Department of Surgery
Duke University School of Medicine
Surgeon-in-Chief
Duke University Health System
ENGAGED, EDUCATED, EMPOWERED

Making the Patient a Partner in Surgical Recovery
How would you define a successful surgery? For many patients seeking medical care, surgery is a means to an end—a hopefully minor inconvenience that will improve their quality of life. But for some, the risk of postoperative complications or a long and painful hospital stay may present formidable challenges.

In today’s healthcare landscape, patients strive to be informed partners, active in the decision-making that leads to their treatment. Improving overall outcomes while educating patients along the way is therefore an imperative to providing superior care. Empowering patients is a tall order—one that requires a redefinition of current standards of care while striving to overhaul the perioperative surgical experience.

OUT WITH OLD METHODS

No group would benefit more from an increased focus on improving quality of care than senior patients, the population with the highest incidence of postoperative complications. The Perioperative Optimization of Senior Health (POSH) program, launched at Duke University in 2011, seeks to meet seniors’ needs.

"Nothing that we do is fancy. It is all really common sense, but it needs to be done, and it needs to be done for every patient," says Sandhya Lagoo-Deenadayalan, MD, PhD, co-director of POSH along with Mitchell Heflin, MD, of the Department of Medicine.

Negative outcomes for senior patients can be avoidable, but only by viewing older patients as a unique subset with distinct characteristics and needs. “An older patient is different; we cannot treat them the same way that we treat a healthy 40-year-old,” Dr. Lagoo says. “Frailty, problems with nutrition, lack of physical activity, cognitive problems, management of chronic diseases, polypharmacy, social and financial vulnerability—these are all issues that need to be understood and addressed.”

POSH’s preemptive strategy anticipates potential obstacles through an interdisciplinary model of care. Eligible patients include all individuals over age 85, and those over age 65 with certain conditions, referred by surgeons to the POSH clinic for a comprehensive preoperative evaluation. Usually a few weeks before surgery, members of the surgical team, geriatricians, anesthesiologists, and social workers engage with the patient and their family in an open dialogue.
“The perioperative plan includes detailed strategies for each patient to work on before surgery, key information and recommendations for the hospital stay, and a better understanding of what transpires during recovery and transition out of the hospital,” Dr. Lagoo says. “This includes preoperative interventions to increase mobility, optimize nutrition, reduce inappropriate medications, and to flag patients at high risk for post-operative delirium.”

By meeting the entire team over a longer session, the patient has a better opportunity to understand their own goals and voice them, and for the surgical team to evaluate and address any potential roadblocks to recovery.

As of January 2018, the POSH clinic has evaluated nearly 1,500 patients. The initial results, published in JAMA Surgery in January 2018 by Dr. Shelley McDonald et al., showed that despite POSH patients being older and having more chronic conditions compared with a control group, their length of hospital stay decreased from 6 to 4 days, they had lower readmission rates at 7 and 30 days, they were more likely to be discharged to home with self-care, and they experienced fewer complications.

While these results are promising, Dr. Heflin and Dr. Lagoo emphasize that continued research and innovation are essential to improving care for senior patients. The team is working on developing a tool for early risk stratification of patients undergoing elective surgery. Ideally, this tool would identify surgical risk based on health factors and surgical complexity, allow for accurate triage to appropriate preoperative services, and provide early estimates of the intensity and timing of ideal optimization strategies.

POSH speaks to the power patients have over their own recovery when given the necessary tools.

NEW APPROACH TO RECOVERY

Using a similar approach, Enhanced Recovery after Surgery (ERAS) helps patients of all ages learn new ways to accelerate their recovery. Duke colorectal surgeon Julie Thacker, MD, leads the charge at Duke in an international effort to improve outcomes.

“Currently, Duke has Enhanced Recovery pathways in place for colorectal and hepatopancreatic surgery, gynecologic oncology, renal transplant, and plastic free flap,” says Dr. Thacker. “We work to optimize outcomes and are at the forefront of protocol creation and implementation. Our work has been used as the model for a nationwide implementation program through NSQIP [National Surgical Quality Improvement Program] and the American College of Surgeons.”

Since its inception in 2010, ERAS principles have reduced length of stay, readmission, reoperations, complications, and infections. ERAS also discourages the use of opioids, decreasing the risk of postoperative dependency. In more than half of the selected colectomy ERAS cases, the patient is discharged one day after surgery.

Keeping the patient involved and engaged in their own recovery is an important part of the process, Dr. Thacker says. The approach begins with a discussion between the patient and a member of the healthcare team, reviewing the surgery and expectations. Combined with better nutrition before surgery, non-narcotic pain medications, and an encouragement to walk and ingest solid food after surgery, the objectives help the patient to get back to a normal routine—and back home—as soon as possible.

Duke’s ERAS model has seen nationwide implementation through NSQIP and the American College of Surgeons, and in an

“Our work has been used as the model for a nationwide implementation program.”

– Dr. Julie Thacker, on ERAS
ongoing implementation project led by the Agency for Healthcare Research and Quality.

NEW FOCUS, OLD IDEA

An essential component of influencing patient outcomes is data, and lots of it; data provide the necessary benchmarks needed for improvement. According to Chief of Abdominal Transplant Surgery Debra Sudan, MD, data collection in transplant surgery is critical, but currently unstandardized and underutilized.

“Patients want to know more information before a transplant,” says Dr. Sudan. “Will they need to come back to the hospital? Are they going to need more surgeries? Will they get an infection? To some patients, this is just as important to them as living. They want to know what is expected.”

Most hospitals do not collect enough transplant surgery data to provide answers, but this may soon change with the Transplant Quality Improvement Program (TransQIP), initiated by the American College of Surgeons and the American Society of Transplant Surgeons. If the name looks familiar, it should—TransQIP is modeled after NSQIP, an invaluable resource used by over 600 participating hospitals since 1994. NSQIP provides improvement benchmarks, but there has not been a program that provides similar transplant-specific data, until now.

“Even though we are blessed with a lot of data collection through SRTR [the Scientific Registry of Transplant Recipients] and UNOS [the United Network for Organ Sharing] for looking at patient graft survival, the data do not look at the complications after transplant,” says Dr. Sudan. “We have been without good benchmark data for standard UTIs, pneumonia, deep vein thrombosis—and we also don’t know rates of rejection with really good validity.”

Without these benchmarks, a program has no way of knowing how it compares to other centers or where it needs to improve. TransQIP can provide answers by tracking data from both donors and recipients for one year posttransplant, helping centers to spend their time improving in the most impactful areas.

Currently, TransQIP tracks any adult patients who have a standard single-organ kidney or liver transplant in participating centers. Beginning in 8 medical centers over a 6-month alpha phase, the beta phase has expanded to 29, with a focus on learning the most important data to collect and how to report it in a meaningful way. The next step is to follow NSQIP’s model of becoming a national standard for surgical data.

“I’m really pleased that Duke supports this initiative, as it isn’t externally funded,” says Dr. Sudan. “The hospital has committed to the cost of the extra staffing it requires for data collection—because we know that in the end we are doing it to benefit our patients.”

As TransQIP expands, it hopes to capture metrics from pretransplant data, allowing for the creation of a transplant risk calculator and decision-making tools. In this way, TransQIP data can provide key information to all stakeholders, offering answers to patients who are weighing the benefits of undergoing transplant surgery.

A NEW PARADIGM

The surgeon, the patient, their loved ones—all may begin the surgical journey with different expectations, goals, and definitions of success. Improving outcomes is most attainable when these goals are voiced and aligned, and when the surgeon–patient relationship is viewed as a partnership by all invested in the patient’s recovery.

Members of the POSH Team:
Sandhya Lago-Deenadayalan, MD, PhD, Associate Professor of Surgery; Christy Cassas, Advanced Practice Provider; Gwendolyn Mumford, Geriatric Access Center Patient Service Representative; Shelley McDonald, MD, Assistant Professor of Medicine; Lisa LeGath, Clinical Nurse III; Mitchell Heflin, MD, Associate Professor of Medicine; Angeline Smith, MLPN.
With 48 million surgical procedures performed annually in the United States, understanding how surgery affects the human body is paramount to keeping patients healthier longer. However, the biological characteristics unique to each individual suggest that a one-size-fits-all approach to surgery may not be the most effective.

In 2017, the Department of Surgery launched the Duke Surgery Bio-Repository 1000 Patient Project (IRB#: Pro00071689), an initiative that aims to collect biospecimens from 1,000 patients before, during, and after 14 different surgical procedures. By collecting samples throughout the surgical process, Duke researchers plan to use these health “snapshots” to form a complete picture of the surgical patient, leading to improved care interventions and, ultimately, better patient outcomes.

“I am very excited about the enormous potential uses of what we are building, both for clinical care and basic science discovery,” says Dr. Shelley Hwang, Professor and Vice Chair of Research. “We are building a comprehensive, one-of-a-kind resource to ask very fundamental questions about how the body responds to injury and how it recovers from this injury. It’s a unique and ambitious project and could really change how we think about surgery and surgical research.”

OPTIMIZING PATIENTS FOR SURGERY

Before a patient heads into the OR, healthcare teams have a window of opportunity to anticipate that patient’s response to the procedure based on their distinct biological signatures. Using data from the 1000 Patient Project, investigators can identify biomarkers of aging to optimize elderly patients before surgery or before they leave the hospital to hasten their recovery and lower their risk of complications. Looking at immunological markers of inflammation, surgeons can get a better understanding of how the immune system responds to traumatic injury and its impact on wound healing.

“We will have the opportunity to understand which baseline molecular markers are associated with an uncomplicated recovery, and which may predict for delayed recovery or complications from surgery,” says Dr. Hwang. “It will be fascinating to see which parts of the immune system are mobilized in response to certain types of surgery.”

While studying biomarkers of surgical recovery, researchers will examine
different patient populations to pinpoint common indicators. These novel discoveries will help to inform healthcare providers when treating patients, enabling them to correct course if needed and try another treatment customized to that patient’s unique biology.

“We want to follow patients before, during, and after surgery to learn more about how we care for them and how they respond to certain treatments so that we can learn how to intervene with that process,” says Mary Beth Davis, Clinical Program Manager. “If we look at how patients recover after their surgery and see something different in patients with cancer vs. patients without cancer, then we use that to inform us of how better to take care of that patient population.”

Because most of the surgical divisions in the Department of Surgery are involved in the study, this multidisciplinary endeavor will provide a wealth of information from a range of surgical disciplines, including data from patients undergoing surgery to treat breast cancer to samples from patients undergoing life-saving transplants. “I think it’s unique because we truly are multidisciplinary across the Department of Surgery so we can see how all surgery patients respond versus a specific niche within surgery,” says Ms. Davis.

ACCELERATING BIOMEDICAL DISCOVERY

All of the patient samples and data will be entered into a central data repository, which Ms. Davis says will fast-track clinical research. Having a repository of samples available and ready to go eliminates the need for new clinical trials to collect patient specimens, meaning researchers can get cutting-edge treatments out to patients faster.

And this project is unique to Duke—Duke Surgery is the first surgery department in the country to collect samples from a variety of surgical procedure types over many different time points during the entire perioperative period.

“Not only are we collecting an unparalleled tissue and data repository, but we will also be collecting clinical data and patient survey data for each sample collection time point,” says Dr. Hwang. “All of these resources will be available to researchers in the Department and our collaborators. We believe this will be an invaluable resource for testing new hypotheses and for exploring innovative avenues of scientific and medical discovery.”

The 1000 Patient Project demonstrates how information from one patient can enrich care for millions of others. With the data, researchers aim to tell the complete story of the surgical patient, and the results of the research will illuminate the path of care for generations of patients to come.

“Ultimately, we hope that this project will help us identify those patients with impaired or abnormal physiologic resilience in order to develop biologic strategies to intervene in this process and allow for improved surgical outcomes,” says Dr. Hwang. “This will be a long-term goal, but one that will have invaluable payoffs for future patients.”

Dr. Hwang would like to acknowledge the following contributors to the 1000 Patient Project: Duke Surgery leadership, faculty, residents, nurses, and research staff; Beth Hollister, Research Practice Manager for the Surgery Office of Clinical Research; Mary Beth Davis, Program Manager for Clinical Research Data Management; Jennifer Cheeseman-Janes, Administrative Director of Research; Mary-Beth Joshi, Assistant Director of the Substrate Services Core; the Department of Anesthesiology; the Department of Biostatistics and Bioinformatics; Duke research cores; and the Office of Research Informatics.
HARNESSING THE IMMUNE SYSTEM
TO IMPROVE PATIENT OUTCOMES

Duke Health introduces new research initiative to overcome hurdles of immunity

Our immune system works around the clock to keep us safe from disease, kicking out invading pathogens that mean to do us harm, while partnering harmoniously with the healthy viruses, fungi, and bacteria that live within us. But what happens when this beautiful symphony starts playing out of tune and our immune system is unable to recognize friend from foe?

Cancer and autoimmune diseases are the result of an immune cacophony that occurs when the immune system cannot distinguish between the self and non-self. In transplantation, a transplant recipient’s immune system may reject a donor allograft because it does not recognize the graft as one of its own. In contrast, certain infectious diseases caused by viruses, such as the human immunodeficiency virus (HIV), manifest because these pathogens have evolved to deftly disguise themselves as a host immune cell.

“Every disease is influenced by immunity,” says Allan Kirk, MD, PhD, David C. Sabiston, Jr. Professor of Surgery and Chair of the Department of Surgery. “The immune system has evolved over millions of years to maintain homeostasis despite continuous threat, and those threats can come from the outside, microorganisms or trauma, but also from the inside when cells that are normal transform into cancer cells or when our immune system inappropriately recognizes our own cells as being foreign, such as an autoimmune disease.”

While significant advances in immunology have led to major breakthroughs in the prevention and treatment of disease, precisely controlling the immune system remains a major obstacle in modern medicine.

In September 2017, Duke Health launched the Translating Duke Health initiative, a multidisciplinary program to address major health challenges in areas where Duke Health can have the greatest impact. The initiative focuses on five key areas of health: cardiovascular disease, neuroscience, children’s health, cancer, and immunology.

Dr. Kirk leads the immunology component, “Controlling the Immune System.” A major goal in advancing understanding of immunity is determining why different patients experience different disease outcomes. Are there certain immune characteristics specific to each individual patient that affect a patient’s disease prognosis?

“The understanding of how immunity can be harnessed as a tool to protect us better to prevent those errors from happening is the real focus of this initiative,” says Dr. Kirk. “The solution we’re seeking is to completely characterize and understand the signals used in that network so they can be harnessed, recognized, and mobilized as tools themselves to bring to bear at will for immunotherapy against cancer, to reverse type 1 diabetes or multiple sclerosis, or, in the most dramatic cases, allow for transplantation of organs from one person to another.”

To accomplish this, the team will define how the immune systems of different patient populations respond to disease. By identifying these “immune signatures,” investigators can devise therapeutic and preventive strategies to control immunity, such as improving immunotherapy as a treatment for cancer, minimizing or eliminating the need for immunosuppressive drugs in transplant recipients, and enhancing immune responses to vaccines against HIV and other infectious diseases.

The initiative aims to develop novel vaccines and therapeutics that will keep the immune symphony playing in harmony, ultimately improving patient health both at Duke and around the world.
The orientation technology used in a Nintendo Wii controller inspired Dr. Josh Broder, Associate Professor of Surgery, Division of Emergency Medicine, to develop a novel ultrasound device for quick, bedside imaging. Working with engineers at Duke and Stanford universities, Dr. Broder invented a method to incorporate a small $10 microchip that translates 2D ultrasound devices into 3D imaging systems. The result is a cost-effective and accessible ultrasound probe for rapid, point-of-care diagnostic imaging.

The idea for the new imaging system came to Dr. Broder while playing a video game with his son. He thought the system’s orientation technology, similar to that used in smart phones, could be employed to improve the imaging capability of a 2D ultrasound probe.

“2D ultrasound machines are becoming ubiquitous in medicine because of the safety, speed, low cost, and diagnostic power,” says Dr. Broder. “But acquiring and interpreting images can still be a challenge – we’re excited by the prospect of revolutionizing ultrasound to make this technology even more accessible and useful.”

By snapping a plastic attachment with an orientation-sensing microchip onto a 2D ultrasound probe, the device can produce highly detailed, oriented 3D anatomical images similar in flexibility to an MRI or CT scan. The team used 3D printing methods to prototype their device, which is already in use in Duke clinical trials.

The research team is studying the role of the device in a wide variety of medical scenarios. In one application, emergency physicians use the device at a patient’s bedside to detect internal bleeding to determine the need for surgery. Another key use may be to identify hydrocephalus in newborns requiring immediate intervention, obviating sedation that is typically used for infants undergoing an MRI and radiation exposure from a CT scan.

Additionally, the team is working to determine how the new technology can unleash the potential of ultrasound for clinicians and patients by making ultrasound less operator dependent. POCUS is especially appealing in rural, low-resource settings, where patients may not have easy access to affordable healthcare, often needing to travel long distances to seek care.

Dr. Broder collaborated with engineers at Duke’s Pratt School of Engineering, including then-undergraduate Matt Morgan, and biomedical engineering instructors and professors Carl Herickhoff and Jeremy Dahl, who are now at Stanford, where they continue to work with Dr. Broder on developing the device.

To learn more about the technology, please visit https://surgery.duke.edu/pocus.
**SURGERY RESEARCH GRANT ACTIVITY**

**Bruce J. Derrick, MD**, Assistant Professor of Surgery, Division of Emergency Medicine, received a grant from the Naval Sea Systems Command for the “Ketogenic Diet for Reduction of CNS Oxygen Toxicity Symptoms in Working Divers.”

**David H. Harpole Jr., MD**, Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a grant from Brigham and Women’s Hospital for “Prospective Validation of Prognostic and Predictive Molecular Tests in Mesothelioma.”

**Brant A. Inman, MD**, Cary N. Robertson, MD, Associate Professor, Division of Urology, received a grant from GenomeDx Biosciences, Inc., for the “Bladder Tumor TURBT Study.”

**Bruce M. Klitzman, PhD**, Associate Professor of Surgery, Division of Plastic, Maxillofacial, and Oral Surgery, received a grant from FirstString Research, Inc., for “A Novel Scaffold to Promote Skin Regeneration.”

**Howard Levinson, MD**, Associate Professor of Surgery, Division of Plastic, Maxillofacial, and Oral Surgery, received a grant from Deep Blue Medical Advances, Inc., for “Development of a Mesh with Enhanced Mechanical Performance to Prevent Hernias.”

**Carmelo A. Milano, MD**, Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a grant from St. Jude Medical, Inc., for “Utilization of Two Heartmate III Pumps as a Total Artificial Heart Replacement.”

**Jennifer K. Plichta, MD**, Assistant Professor of Surgery, Division of Advanced Oncologic and Gastrointestinal Surgery, received a grant from the Color Foundation for “Genetic Testing for Women with High-Risk Breast Lesions.”

**Dana D. Portenier, MD**, Assistant Professor of Surgery and Chief, Division of Metabolic and Weight Loss Surgery, received a grant from Intuitive Surgical, Inc., for “Ex-Vivo Stapling of Bariatric Gastrectomy Specimens.”

**Peter K. Smith, MD**, Professor of Surgery and Chief, Division of Cardiovascular and Thoracic Surgery, received a grant from Mount Sinai School of Medicine for the “Network for Cardiothoracic Surgical Investigations in Cardiovascular Medicine.”

**Catherine A. Staton, MD**, Assistant Professor of Surgery, Division of Emergency Medicine, received a grant from the National Institutes of Health for “Developing Capacity to Improve Care Transitions for Injury Patients in Tanzania.”

**Julie K. M. Thacker, MD**, Associate Professor of Surgery, Division of Advanced Oncologic and Gastrointestinal Surgery, received a grant from MedBlue Incubator, Inc., for “Data Architecture for Duke Surgery Bio-repository.”

**Joseph W. Turek, MD**, Associate Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a grant from the Marfan Foundation for “A TRPC4-Dependent Amplification Pathway Contributes to Aortic Aneurysm Progression in Marfan Syndrome.”

**Alexander T. Limkakeng Jr., MD, MHS**, Associate Professor of Surgery, Division of Emergency Medicine, received a grant from Vanderbilt University Medical Center for “CCC for NHLBI Prevention and Early Treatment of Acute Lung Injury PETAL Network – VIOLET.”

**Carmelo A. Milano, MD**, Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received an award from AtriCure, Inc., for “AtriClip® Left Atrial Appendage Exclusion Concomitant to Structural Heart Procedures (ATLAS).”

**Jacob N. Schroder, MD**, Assistant Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a grant from AtriCure, Inc., for “AtriClip® Left Atrial Appendage Exclusion Concomitant to Structural Heart Procedures (ATLAS).”

**Sabino Zani Jr., MD**, Assistant Professor of Surgery, Division of Advanced Oncologic and Gastrointestinal Surgery, received an award from Delcath for “A Randomized, Controlled Study to Compare the Efficacy, Safety and Pharmacokinetics of Melphalan/HDS Treatment Given Sequentially Following Cisplatin/Gemcitabine Versus Cisplatin/Gemcitabine (Standard of Care) in Patients with IntraHeaptic Cholangiocarcinoma.”

**Matthew Hartwig, MD**, Associate Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received an award from Intuitive Surgical, Inc., for “A Retrospective Multi-Center Study for Evaluation of Clinical Outcomes with Lobectomy for Lung Cancer.”

**Shelley Hwang, MD, MPH**, Professor of Surgery and Vice Chair of Research, Division of Advanced Oncologic and Gastrointestinal Surgery, received an award from Luminex/NIH for the “Feasibility Study Phase C: Expansion Into Multiple Institutions for Training in the Use of the LUM Imaging System for Intraoperative Detection of Residual Cancer in the Tumor Bed of Female Subjects With Breast Cancer.”

**Brant A. Inman, MD**, Cary N. Robertson, MD, Associate Professor, Division of Urology, received an award from Urogen (Mitogel) for “A Phase 3 Multicenter Trial Evaluating the Efficacy and Safety of Mitogel on Ablation of Upper Urinary Tract Urothelial Carcinoma.” Additionally, Dr. Inman received an award from GenomeDx Biosciences, Inc., for the “Validation of Genomic Classifiers in Muscle Invasive Bladder Cancer Patients Treated With Neoadjuvant Chemotherapy and Radical Cystectomy.”

**CLINICAL TRIALS**

**Alexander T. Limkakeng Jr., MD, MHS**, Associate Professor of Surgery, Division of Emergency Medicine, received a grant from Vanderbilt University Medical Center for “CCC for NHLBI Prevention and Early Treatment of Acute Lung Injury PETAL Network – VIOLET.”

**Carmelo A. Milano, MD**, Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received an award from Nupulse for the “Use of the NuPulseCV iVAS for the Treatment of Bridge-To-Transplant Patients: A Feasibility Study.”

**Jacob N. Schroder, MD**, Assistant Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a grant from AtriCure, Inc., for “AtriClip® Left Atrial Appendage Exclusion Concomitant to Structural Heart Procedures (ATLAS).”

**Sabino Zani Jr., MD**, Assistant Professor of Surgery, Division of Advanced Oncologic and Gastrointestinal Surgery, received an award from Delcath for “A Randomized, Controlled Study to Compare the Efficacy, Safety and Pharmacokinetics of Melphalan/HDS Treatment Given Sequentially Following Cisplatin/Gemcitabine Versus Cisplatin/Gemcitabine (Standard of Care) in Patients with IntraHeaptic Cholangiocarcinoma.”
Cancer Immunotherapy with Recombinant Poliovirus Induces Ifn-Dominant Activation of Dendritic Cells and Tumor Antigen-Specific Ctls.

Classifying the Evolutionary and Ecological Features of Neoplasms.

Effect of Cerebral Embolic Protection Devices on CNS Infarction in Surgical Aortic Valve Replacement: A Randomized Clinical Trial.

Effect of Obesity and Underweight Status on Perioperative Outcomes of Congenital Heart Operations in Children, Adolescents, and Young Adults: An Analysis of Data From the Society of Thoracic Surgeons Database.

Five-Year Outcomes After On-Pump and Off-Pump Coronary-Artery Bypass.

Genetic and Functional Drivers of Diffuse Large B Cell Lymphoma.

Hearing Loss in Adults.

Initiation of HIV Neutralizing B Cell Lineages with Sequential Envelope Immunizations.

Insights into Beta Cell Regeneration for Diabetes via Integration of Molecular Landscapes in Human Insulinosomas.

Programmable Assembly of Pressure Sensors Using Pattern-Forming Bacteria.


*Journals with an Impact Factor greater than 10.0
Duke Surgery launches educational research program to improve the learning experience for medical students and residents

As the healthcare landscape continues to evolve, the education of medical students and residents in surgery requires constant evaluation to provide consistently high-quality, cutting-edge patient care.

In November 2015, the Department of Surgery created the Duke Surgical Education Research Group (SERG), a grassroots, resident- and medical student–led initiative that aims to improve surgical education at Duke University, in the local Durham community, and worldwide.

Cofounded by John Migaly, MD, General Surgery Residency Program Director, and Shanna Sprinkle, MD, PGY5 General Surgery Resident, Duke SERG brings together multidisciplinary teams in a collaborative environment to focus on four key areas of surgical education: knowledge, curricula, technical skills, and behavior.

Dr. Migaly says the impact of the new partnership became evident at the group’s first meeting. “When we all met in one room, we saw more people helping each other with their projects and, more importantly, a lot of the ideas were really ground-up instead of top-down,” says Dr. Migaly, Duke SERG Faculty Leader. “I think this ground-up approach really makes the group successful.”

The program offers a unique research opportunity for Duke medical students and residents interested in education research. Trainees can collaborate with other faculty members from around the university, including behavioral biologists, neuroscientists, and statisticians.

“We had a lot of medical students and residents who were interested in doing these types of research projects so the idea was to coalesce that into one formalized group,” says Dr. Sprinkle, Duke SERG Resident Co-Leader.

Duke SERG integrates a rigorous research approach using scientifically robust methodology to overhaul the way medical students and residents are trained in surgery. Because of the breadth of resources provided by the Duke Department of Surgery, Duke SERG is uniquely suited to respond to the critical scientific questions that emerge from the group.

“By asking more difficult questions at a place like Duke, we have the support...
Morgan L. Cox, MD, demonstrates suturing techniques to medical students in the Surgery Technique and Review (STAR) Course.

Below: Medical students practice suturing on simulated skin with heat-activated tattoos.

In the group to try and tackle those questions that groups at other institutions may not be able to answer,” says Morgan Cox, MD, PGY4 General Surgery Resident and Duke SERG Resident Co-Leader.

Since its inception, the group’s impact has reached far and wide, including several large grants totaling over $250,000, presentations at national meetings, and 6 research articles in peer-reviewed journals.

CREATING AN INCUBATOR OF INNOVATION

In April 2017, Duke SERG implemented the Surgery Technique and Review (STAR) course, a 2-week surgery preparatory course for medical students looking to pursue a career in surgery. The STAR course prepares students for real challenges as surgical residents via technical skills training in the Duke Human Fresh Tissue Laboratory, where they receive a unique hands-on experience.

In addition to the STAR course, the group has produced several training devices to help medical students hone their skills, including a new device that measures tension when students tie surgical knots, a brain stimulation project, and simulated skin with tattoos that disappear and appear to help students know if they are suturing correctly.

By focusing on technological advances in surgical education, SERG has developed innovative interventions to improve resident education and wellness. The group is currently conducting a time study to determine how the electronic medical record system interferes with a resident’s or faculty member’s daily activities.

“We have terabytes of data on every keystroke that every resident and faculty member makes during the day so we can figure out how much time residents and faculty are spending on a medical record,” says Dr. Migaly. “How much of that time is after 6:00 pm, and how much of an 80-hour work week is spent in front of a computer instead of in an operating room or in front of a patient?”

With funding from an innovation grant, Duke SERG developed a podcast application to assist auditory learners who may face challenges in residency. “Auditory learners do really well in medical school because it’s an auditory learning system. Basically, you go to lectures. That’s how you learn,” says Dr. Sprinkle. “But you transition into residency and there’s not a good auditory modality out there.”

Because the app tracks usage statistics, the group can assess the impact of the intervention. Dr. Sprinkle says these data can then be used in resident educational databases to help guide educators on which topics to cover in the curriculum.

TRANSLATING DISCOVERY INTO REAL-WORLD APPLICATION

Duke SERG aligns with the department’s overall efforts to translate discovery into real-time applications. Improving student and resident surgical training via innovative research projects will ultimately impact the health of patients whom they will care for later in their careers.

“The efforts are not fettered or bound by a traditional academic center way of approaching things,” says Dr. Migaly. “I see this place as a think tank, and I think that’s what plays into the overall philosophy here of being more aspirational and more innovative than traditional academic centers.”

If you would like to learn more about Duke SERG, please email shanna.sprinkle@duke.edu and morgan.cox@duke.edu.
JONATHAN C. ROUTH, MD, MPH, RECEIVES ENDOWED PROFESSORSHIP

Jonathan C. Routh, MD, MPH, Division of Urology, has been appointed the Paul H. Sherman, MD, Associate Professor of Surgery by the Board of Trustees. This endowment recognizes a faculty member who is a scholar of true eminence and excellence in the Department of Surgery. Dr. Jeffrey Marcus, Chief of Plastic, Maxillofacial, and Oral Surgery, previously held this distinguished professorship.

"Jonathan is a consummate professional and one of those exceedingly rare individuals in academic medicine: the true quadruple threat," says Glenn Preminger, MD, Chief of Urology. "In his brief career, he has already demonstrated excellence as a clinician, researcher, teacher, and leader of the urologic community."

"Jon has played a lead role in developing the Duke multidisciplinary programs in robotic and minimally invasive surgery, gender/disorders of sex development, pediatric oncology, and renal transplant. He is an incredibly productive urologic researcher, having published 117 peer-reviewed research papers and in the last 10 years has successfully obtained >$1.3 million in grant funding. At Duke, he has been named to multiple leadership development programs, most recently as a Chancellor’s Leadership Fellow and a Duke Health Fellow."

The professorship endowment was established in the name of Paul H. Sherman, MD, who attended Duke University in 1944 and earned a medical degree from the Duke University School of Medicine in 1946, through the World War II accelerated degree program. Dr. Sherman was a prominent cardiothoracic surgeon in Orlando, Florida, and performed Florida Hospital’s first open-heart surgery in 1968. Dr. Sherman established this endowment through his estate to support an associate professor in the Department of Surgery.

“Jonathan is the true quadruple threat, demonstrating excellence as a clinician, researcher, teacher, and leader of the urologic community.”

– Dr. Glenn Preminger

FACULTY PROMOTIONS

CALHOUN CUNNINGHAM, MD

Division of Head and Neck Surgery & Communication Sciences, was promoted to Associate Professor of Surgery.

RACHEL GREENUP, MD

Division of Advanced Oncologic and Gastrointestinal Surgery, was promoted to Associate Professor of Surgery.
JULIE ANN SOSA, MD, NAMED CHAIR OF UCSF SURGERY

It is with mixed emotions that we announce that Dr. Julie Ann Sosa will be leaving Duke Surgery at the end of March to become Chair of the Department of Surgery at the University of California, San Francisco. This is widely recognized as one of the premier surgical programs in the country and her selection as the new chair is a career-defining accomplishment. Dr. Sosa continues the long tradition of accomplished Duke surgeons rising to the rank of Chair. While she will be sorely missed, Dr. Sosa’s move continues to be an indication as to the quality and strength of the Duke faculty.

Born in Montreal and raised in upstate New York, Dr. Sosa received her AB at Princeton and her MA at Oxford. At Johns Hopkins, she obtained her MD and was a Robert Wood Johnson Clinical Scholar, going on to complete the Halsted residency program and a fellowship before finishing as an assistant chief of service. Dr. Sosa served on the faculty at Yale University before coming to Duke, where she was highly productive and rose to the rank of Professor of Surgery with tenure. In addition to being a skilled endocrine surgeon and exceptional teacher, she directed a highly impactful research program focused on thyroid cancer outcomes and etiologies. Beyond her personal research effort, she has served as director of the Surgical Center for Outcomes Research (SCORES) for the Department of Surgery, leader of the Endocrine Neoplasia Diseases Group, and co-leader for the Solid Tumor Therapeutics Program at the Duke Cancer Institute and the Duke Clinical Research Institute.

Dr. Sosa has been a leader nationally, serving as treasurer of the American Thyroid Association (ATA), member of the Executive Council of the Society of Surgical Oncology, and member of the Board of Directors of the ATA, the International Thyroid Oncology Group, and the Association for Academic Surgery Foundation. She was recently elected editor-in-chief of the World Journal of Surgery, having previously served as deputy editor of JAMA-Surgery and associate editor of the Journal of Surgical Research and Current Opinion in Oncology. She serves on national practice guidelines committees for the management of thyroid nodules, differentiated thyroid cancer, hyperthyroidism, and neuroendocrine tumors.

We will miss Dr. Sosa and have benefited greatly from her accomplishments. We know she will thrive in her new role in San Francisco.
ANDREW S. BARBAS, MD

Assistant Professor of Surgery, Division of Abdominal Transplant Surgery, was selected for the 2018 Duke LEADER program, a 3-day leadership training workshop designed for junior faculty who lead research groups.

LOLA FAYANJU, MD, MA, MPH

Assistant Professor of Surgery, Division of Advanced Oncologic and Gastrointestinal Surgery, was selected for the 2018 Duke LEADER program, a 3-day leadership training workshop designed for junior faculty who lead research groups.

EDA K. HOLL, PhD

Assistant Professor of Surgery, Division of Surgical Sciences, was selected for the 2018 Duke LEADER program, a 3-day leadership training workshop designed for junior faculty who lead research groups.

GEORGIA M. BEASLEY, MD, MHSC

Assistant Professor of Surgery, Division of Advanced Oncologic and Gastrointestinal Surgery, was selected for the 2018 Duke LEADER program, a 3-day leadership training workshop designed for junior faculty who lead research groups.

JEFFREY G. GACA, MD

Associate Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received the Strength, Hope, and Caring Award from Duke Hospital.

ALLAN D. KIRK, MD, PhD

David C. Sabiston, Jr. Professor of Surgery and Chair, was inducted into the National Academy of Medicine. Additionally, Dr. Kirk received a Distinguished Alumnus Award from the Duke Medical Alumni Association.

LINDA C. CENDALES, MD

Associate Professor of Surgery, Division of Plastic, Maxillofacial, and Oral Surgery, was invited for a TEDx talk on human transplantation.

CHARLES J. GERARDO, MD

Associate Professor of Surgery and Chief, Division of Emergency Medicine, was elected to the Executive Committee of the Duke Hospital Medical Staff.

MICHAEL E. LIPKIN, MD

Associate Professor of Surgery, Division of Urology, was selected as a fellow for the Duke Clinical Leadership Program, a leadership development program designed for mid-career clinical faculty.

BRADLEY H. COLLINS, MD

Associate Professor of Surgery, Division of Abdominal Transplant Surgery, was a featured speaker at a Donate Life NC event to mark the registration of 5 million organ donors by the NC Department of Motor Vehicles.

MATTHEW G. HARTWIG, MD

Associate Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a 2017 Scholars Award from the Duke Surgical Center for Outcomes Research (SCORES).

DAVID C. MONTEFIORI, PhD

Professor of Surgery, Division of Surgical Sciences, was named among the top 1% of the world’s most cited researchers in microbiology according to Clarivate Analytics.
JOHN H. STEWART IV, MD, MBA
Associate Professor of Surgery and Chief, Durham VA Medical Center, has been elected to the American Board of Surgery for a 6-year term.

PETER K. SMITH, MD
Professor of Surgery and Chief, Division of Cardiovascular and Thoracic Surgery, has been elected to the VA National Surgery Office’s Cardiothoracic Surgery Surgical Advisory Board (SAB) for a 3-year term.

LAURA H. ROSENBERGER, MD
Assistant Professor of Surgery, Division of Advanced Oncologic and Gastrointestinal Surgery, was named Eastern Mennonite University’s 2017 Outstanding Young Alumnus.

DEBRA L. SUDAN, MD
Professor of Surgery and Chief, Division of Abdominal Transplant Surgery, has been elected to the Board of Directors of the Halsted Society.

LIANA PUSCAS, MD, MHS
Associate Professor of Surgery, Division of Head and Neck Surgery & Communication Sciences, has been elected to the National Board of Medical Examiners as a member representing the American Medical Association.

GEORGIA D. TOMARAS, PhD
Professor of Surgery, Division of Surgical Sciences, was named among the top 1% of the world’s most cited researchers in microbiology according to Clarivate Analytics. Additionally, Dr. Tomaras was elected to Fellowship in the American Academy of Microbiology.

BETTY TONG, MD
Associate Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a 2017 Scholars Award from the Duke Surgical Center for Outcomes Research (SCORES).

K. LOUISE JACKSON, MD
Assistant Professor of Surgery, Division of Advanced Oncologic and Gastrointestinal Surgery

Dr. Jackson earned her undergraduate degree from Oxford University and medical degree from University College London. She completed a general surgery residency at Brown University and the University of Utah, followed by a colon and rectal surgery fellowship at the Cleveland Clinic.

Her clinical expertise includes the management of both malignant and benign colorectal diseases, including colon cancer, rectal cancer, hereditary polyposis, and anal cancer; inflammatory bowel disease, including ulcerative colitis and Crohn’s disease; and benign colon and rectal disorders, such as diverticulitis, hemorrhoids, anal fistulae, and rectal prolapse.
MISSION
Through sustainable, multidisciplinary teams we:

• 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, please contact Marcy Romary, Senior Major Gifts Officer, with Duke Health Development and Alumni Affairs at marcia.romary@duke.edu or visit surgery.duke.edu/gift.