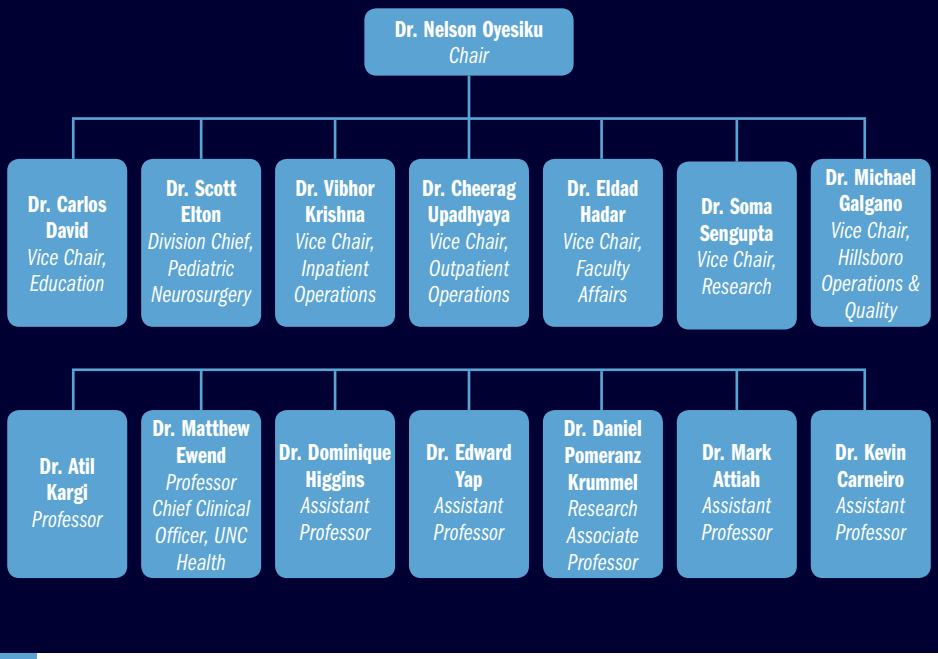
UNC | SCHOOL OF MEDICINE
Neurosurgery

NEUROSURGERY 2024 REPORT

INSIDE

DEPARTMENT OF NEUROSURGERY ORGANIZATIONAL CHART



MESSAGE FROM THE CHAIR

Friends, Colleagues, and Alumni,

In the spring of 2021 amidst the ongoing COVID-19 pandemic, I made the decision to leave Emory University to become the Chair of Neurosurgery at the University of North Carolina (UNC) School of Medicine at Chapel Hill, where I took on new responsibilities in leadership, strategy, operations, recruitment, financial management, and fundraising.

Since then, we have worked tirelessly to accelerate our vision in clinical care, education, and research, and our transformation continues to unfold. This 2024 Annual Review of the Department of Neurosurgery—demonstrates the essence of the quote, "Esse Quam Videri" (to be rather than to seem)—and reflects our commitment to align our internal ethos with our external aspirations, staying true to our core mission while embracing growth and innovation. This quote, also the state motto of North Carolina, serves as a reminder to remain authentic and purposeful, much like the historic Old Well that graces the cover of this gazette and documents our journey.

A NEW VISION FOR GROWTH AND EXCELLENCE

The past three years have been defined by bold and purposeful mission-oriented strategic decisions, a shared commitment to progress, and implementation of new initiatives. Our efforts have been supported by colleagues, institutional leadership, and the broader UNC community, enabling us to make substantial strides in improving our clinical service, research capabilities, and educational programs.

Upon my arrival in 2021, the department consisted of 14 residents, one physiatrist, one research faculty member, and eight clinical neurosurgeons, including Dr. Matthew Ewend (former Chair of Neurosurgery and now UNC Chief Clinical Officer), Dr. Scott Elton (Director of Pediatric Neurosurgery), Dr. Eldad Hadar (former Residency Program Director and now Vice Chair for Faculty Affairs and Section Chief of Functional Neurosurgery), Dr. Edward Yap (Assistant Professor in Neuroendovascular Surgery), and Dr. Kevin Carneiro (Associate Professor of Neurosurgery and Physical Medicine Rehabilitation).

When I joined the department, our initial focus was on recruitment and investment. With committed institutional support, we have successfully recruited ten new clinical faculty members, further strengthening our team:

- **Dr. Carlos David** – *Program Director, Vice Chair of Education, and Division Chief of Cerebrovascular and Skull Base Surgery (from Tufts University/Lahey Clinic)*
- **Dr. Michael Galgano** – *Vice Chair of Hillsborough Operations and Chief Quality Officer leading the spine tumor and spinal deformity program (from Upstate Medical University)*
- **Dr. Cheerag Upadhyaya** – *Vice Chair of Outpatient Operations and Chief Transformation and Business Development Officer leading the minimally invasive spine surgery and motion preservation program (from the University of Missouri Kansas City)*
- **Dr. Mark Attiah** – *Director of peripheral nerve surgery in the Department of Neurosurgery and dual fellowship-trained in complex spine and peripheral nerve surgery (from the University of Miami)*
- **Dr. Vibhor Krishna** – *Associate Professor and Neurosurgery Service Line Leader at UNC Medical Center and an NIH R01-funded surgeon-scientist with expertise in functional neurosurgery (from The Ohio State University)*
- **Dr. Dominique Higgins** – *Neurosurgical oncologist with expertise in awake tumor surgery and a focus on malignant brain tumors (from University of Miami)*
- **Dr. Soma Sengupta** – *Joint neurology-neurosurgery neuro-oncological clinician-scientist. Dr. Sengupta (from University of Cincinnati) also serves as Vice Chair of Research in the Department of Neurosurgery and Division Chief of Neuro-Oncology.*
- **Dr. Yasmeen Rauf** – *Joint neurology-neurosurgery neuro-oncological clinician-scientist. Dr Rauf is a clinical trialist and an NIH R21 funded researcher (from the Cleveland Clinic).*
- **Dr. Atil Kargi** – *Co-Director of the UNC Pituitary Tumor Clinic specializing in pituitary endocrinology (from the University of Miami).*
- **Dr Kimberly Hamilton** – *Pediatric Neurosurgeon (from West Virginia University)*

MESSAGE FROM THE CHAIR

ENHANCING CLINICAL AND OPERATIONAL EXCELLENCE

UNC Health and our department have made substantial investments in new technology, including LITT (laser ablation), robotic-assisted surgery, and both high and low frequency MRI-guided focused ultrasound (650 KHz and 220 KHz systems).

We have made significant strides in optimizing our clinical operations and expanding our facilities. In November 2022, we launched a new consolidated outpatient center at the UNC Ambulatory Care Center (ACC), bringing all neurosurgical outpatient services to a single location. This facility has improved patient access, streamlined operations, and enhanced our ability to provide specialized care to patients from across North Carolina and beyond.

Our outpatient clinical operations, led by Dr. Cheerag Upadhyaya, offer expertise across the neurosurgical specialties including spine and peripheral nerve, functional neurosurgery, oncology, cerebrovascular and pediatric neurosurgery. To meet the growing demand, we added advanced practice providers and outpatient surgical nurse coordinators dedicated to improving care coordination and patient outcomes.

Inpatient services, overseen by Dr. Vibhor Krishna, focus on providing quality and patient-centered care. This year, we celebrated the opening of the North Carolina Surgical Hospital, a state-of-the-art facility with 26 operating rooms and 80 private surgical intensive care beds. We have translocated to this new hospital allowing us to serve more patients and continue delivering exceptional surgical care.

ADVANCING RESEARCH

We are deeply committed to, and have been successful in advancing, our research mission. We secured four new federal grants (including NIH R01, NIH K12, NIH R21, and DoD).

Some of our more noteworthy research funding accomplishments include:

- **Dr. Vibhor Krishna** awarded NIH R01 grant for FUS Ablation research
- **Dr. Dominique Higgins** received the NIH NRCDP award to fund brain tumor research
- **Dr. Soma Sengupta** and **Dr. Daniel Pomeranz Krummel** received the ABTA Discovery Grant
- **Dr. Soma Sengupta** awarded DoD grant as a co-I.
- **Dr. Yasmeen Rauf** awarded NIH R21 grant for focused ultrasound brain tumor research
- **Dr. Dawn Kernagis** awarded $4.25 million from the U.S. Department of Defense

The Second Annual Weatherspoon Brain Tumor Conference will be held in March 2025 featuring a distinguished panel of speakers, including keynote lectures from Dr. Vinay Puduvalli (Chair of Neuro-oncology at MD Anderson) and Dr. Jeremy Rich (soon to be Associate Director of Translational Research at the UNC Lineberger Comprehensive Cancer Center).

We expanded our research facilities to include wet and dry lab space, a research coordinator, and postdoctoral fellows.

NEUROSURGERY RESIDENT EDUCATION

Our educational mission remains a cornerstone of the department. With the recruitment of Dr. Carlos David as the residency program director, along with a new residency program coordinator, Kelly Lanier, we are addressing residency program needs and have enhanced our training infrastructure. We also benefit from a world-class surgical skills lab, led by Crystal Lincoln, that incorporates simulation and virtual reality technologies to enhance residency training.

Our multimedia team, including medical illustrators, an animator, and a videographer, has played a vital role in creating educational materials and publishing and promoting our department's work.

Dr. Michael Galgano has led a unique effort to enhance spine surgical education at the national level through the publication of several peer-reviewed operative videos in a variety of neurosurgical journals. Several residents and medical students at UNC are an integral part of his research team.

PHILANTHROPIC SUPPORT

We are deeply grateful for the support of our donors, whose generosity has been instrumental in advancing our mission. Notably, Tom and Nancy Chewning's philanthropic gift enabled the acquisition of a low-frequency focused ultrasound system, a cutting-edge technology that is advancing clinical trials in brain tumor treatment. Additionally, the Weatherspoon family continues to support the annual Weatherspoon Brain Tumor Symposium and neuro oncological research more broadly. We also received philanthropic support from the Heilman family to continue funding pituitary research.

LOOKING AHEAD

Our progress over the past three years has been transformative, but this is only the beginning. We remain committed to continuing our progress and growth, fostering innovation, and maintaining a collaborative, patient-centered approach. With the continued support of our faculty, residents, staff, students, donors, and the institution at large, we are confident that the Department of Neurosurgery will continue to excel in all aspects of clinical care, research, and education. Thank you for your continued support and commitment to our mission.

Nelson M. Oyesiku, MD, MSc (Lond), PhD, FACS, FAANS

Van L. Weatherspoon, Jr. Eminent Distinguished Professor & Chair, Department of Neurosurgery
Professor, Medicine (Endocrinology)
University of North Carolina at Chapel Hill

Message from the Vice Chair of Faculty Affairs, Dr. Eldad Hadar

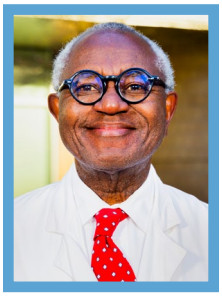
The faculty members that make up UNC Health's Department of Neurosurgery come from diverse backgrounds and surgical training programs. We are fortunate to have a department with specialists in all aspects of neurosurgery to provide exceptional patient care, and to train the next generation of neurosurgeons. Our residency program is fully accredited and accepts two residents each year for seven years of neurosurgical training.

In addition to education and patient care, our faculty members are dedicated to research in various areas of the neurosciences. Our faculty members aim to improve quality of life and survival rates for diseases of the nervous system that historically have been difficult to treat.

With new technologies, including robotic surgery, laser ablation, 650 KHz and 220 KHz systems, our department offers cutting-edge treatment options. Our faculty members are also part of many multidisciplinary teams on campus that meet regularly to discuss complex cases and develop treatment plans for each individual patient. Our recent transition into the newly constructed North Carolina Surgical Hospital provides us with state-of-the-art surgical facilities.

Outside of UNC Health, our physicians are invited regularly to give presentations at other health care institutions and elite conferences around the world. Our physicians are also actively involved in various board and leadership roles for prestigious committees and academic publications in the fields of neurosurgery.

The academic and clinical successes of our physicians have created a strong neurosurgery program that will continue to lead the way in the diagnosis and treatment of neurological diseases in North Carolina.



Nelson Oyesiku, MD, MSc (Lond), PhD, FACS, FAANS

Department Chair | Van L. Weatherspoon, Jr. Eminent Distinguished Professor
Clinical specialty: pituitary tumors

Dr. Oyesiku's clinical and research focus is on the surgical treatment and molecular biology of pituitary tumors and is co-director of the UNC Pituitary Center. Dr. Oyesiku has performed more than 4,000 surgeries for pituitary tumors and has served in various state, regional, national, and international roles for all major neurosurgical organizations.

PROFESSORS

Matthew Ewend, MD

President, UNC Physicians | Chief Clinical Officer, UNC Health | Kay M. and Van L. Weatherspoon Distinguished Professor of Neurosurgery
Clinical specialty: hydrocephalus, brain tumors

Dr. Ewend is the Chief Clinical Officer of UNC Health, President of UNC Physicians, and former Chair of the Department of Neurosurgery. Dr. Ewend's clinical and research interests center on endoscopic and minimally invasive treatment of brain tumors, and the treatment of hydrocephalus. He also oversees the quality program, the value program, and the partnership of UNC Physicians with UNC Health hospitals.

Carlos David, MD

Vice Chair, Education | Division Chief, Cerebrovascular and Skull Base Surgery | Residency Program Director | Professor
Clinical specialty: cerebrovascular and skull base surgery

Dr. David's expertise includes skull base and complex brain tumors, endoscopic skull base surgery, and cerebrovascular surgery. As Vice Chair of Education and Residency Program Director, Dr. David is passionate about, and dedicated to medical education. He is also active in organized neurosurgery, as past Vice Chair of the AANS/CNS Section on Cerebrovascular Surgery, officer in the North American Skull Base Society., and Chair of the Nominating Committee of the WFNS and the AANS Scientific Program.

Scott Elton, MD, FAANS

Children's Hospital Surgeon-in-Chief | Division Chief and Director of Pediatric Neurosurgery | Professor
Clinical specialty: pediatric neurosurgery

Dr. Elton joined the Department of Neurosurgery in January 2013 to develop the Division of Pediatric Neurosurgery, where he now serves as Division Chief and Director. Dr. Elton has worked in both community and academic hospitals in a wide variety of practices. He is devoted to residents and medical students education, cost containment, and creating pragmatism in care.

Eldad Hadar, MD

Vice Chair, Faculty Affairs | Section Chief of Functional Neurosurgery | Professor
Clinical specialty: functional neurosurgery

Dr. Hadar serves as director of the epilepsy surgery program at UNC Health and is a member of the multidisciplinary team at the UNC Epilepsy Center. He applies the latest technology for epilepsy surgery, and was the first physician at UNC Health to use laser interstitial thermal therapy (LITT) to treat both adult and pediatric patients with epilepsy. Dr. Hadar is also a member of the multidisciplinary deep brain stimulation (DBS) team at UNC Health that has performed over 1,000 DBS surgeries.

Atil Kargi, MD

Co-Director of the UNC Pituitary Tumor Clinic | Clinical Endocrinologist | Professor
Clinical specialty: endocrinology, diseases of the pituitary gland

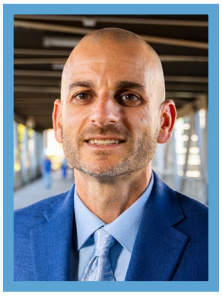
Dr. Kargi is a clinical endocrinologist specializing in diseases of the pituitary gland, including pituitary tumors, hypopituitarism, Cushing's disease, and Acromegaly. He is the Co-Director of the UNC Pituitary Tumor Center. His research interests focus on the biology of the pituitary gland and its hormones, and in improving diagnostic methods and medical therapies for patients with pituitary disorders.

Soma Sengupta, MD, PhD, MBA, FRCP, FAAN, FANA

Vice Chair, Research | Division Chief, Neuro-Oncology | Vice Chair, Neurology | Professor
Clinical specialty: brain tumors

Dr. Sengupta is a physician-scientist and clinical trialist specializing in brain tumor treatment and research with over 90 publications on clinical trials, case reports, lab-based research, and healthcare policy. Dr. Sengupta's collaborative research in the SoDa Lab looks to improve patient outcomes for brain tumor patients. Dr. Sengupta was recently selected as the Mayfield Scholar, which will allow her to dedicate 60% of her time to brain tumor research.

ASSOCIATE PROFESSORS



Michael Galgano, MD, FAANS

Vice Chair, Hillsborough Operations | Chief Quality Officer | Clinical Associate Professor
Clinical specialty: spinal oncology

His clinical and academic focus is on spinal oncology and deformity surgery. He treats patients with intrinsic spinal cord tumors, primary and metastatic vertebral column tumors, scoliosis, and kyphosis. He is director of the spine tumor and spinal deformity programs in the Department of Neurosurgery at UNC Health. Dr. Galgano also treats other spinal conditions such as trauma, degenerative disease, and infections.

Vibhor Krishna, MD

Vice Chair, Inpatient Operations | Service Line Leader | Associate Professor
Clinical specialty: functional neurosurgery

Dr. Krishna is a surgeon-scientist in functional neurosurgery and neuromodulation. His research aims to enhance neuromodulation's effectiveness through personalized medicine, develop and optimize minimally invasive neurosurgery, and test emerging surgical treatments in clinical trials. He has published over 80 research papers in various prestigious journals.

Daniel Pomeranz Krummel, PhD

Research Associate Professor
Clinical specialty: malignant brain tumors

Dr. Pomeranz Krummel's research focus is on the development of approaches to improve treatment of malignant brain tumors, both primary and metastatic. His collaborative research in the SoDa Lab is advancing a novel class of small molecule compounds to improve effectiveness and reduce toxic side-effects of radiation, chemotherapy, and immunotherapy.

Cheerag Upadhyaya, MD, MBA, MSc, FAANS, FACS

Vice Chair, Outpatient Operations | Chief Transformation and Business Development Officer | Clinical Associate Professor
Clinical specialty: minimally invasive spine, motion preservation surgery

Dr. Upadhyaya leads the Minimally Invasive and Motion Preservation Program, focusing on innovative approaches to optimize outcomes for patients. As Vice Chair of Outpatient Operations, Dr. Upadhyaya has driven transformative initiatives, including consolidating outpatient neurosurgery services into a single state-of-the-art clinic, streamlining patient care, and fostering multidisciplinary collaboration. Deeply committed to multidisciplinary care, research, and innovation, Dr. Upadhyaya strives to enhance clinical outcomes and improve the patient experience, setting new standards for excellence in neurosurgery.

ASSISTANT PROFESSORS

Mark Attiah, MD, MPH, MS, MBE

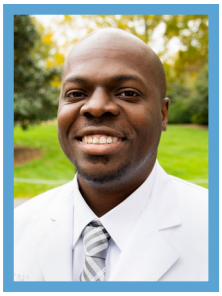
Director of Peripheral Nerve Surgery | Assistant Professor
Clinical specialty: peripheral nerve surgery, minimally invasive and complex spine surgery

Dr. Attiah's clinical expertise is in complex and minimally invasive spine surgery and peripheral nerve surgery. He directs peripheral nerve surgery in the Department of Neurosurgery. He is one of only a few neurosurgeons in the country who specializes in the treatment of complex peripheral nerve disorders leading to extremity pain and weakness, including nerve entrapments, peripheral nerve tumors, brachial plexus and nerve injuries, and thoracic outlet syndrome. He performs nerve transfers and reconstructions to restore limb function. His research interests involve leveraging machine learning and artificial intelligence.

Dr. Kimberly Hamilton, MD

Assistant Professor
Clinical specialty: pediatric neurosurgery

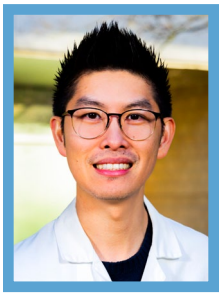
Dr. Hamilton is a board-certified pediatric neurosurgeon. She joined the Department of Neurosurgery from West Virginia University. Dr. Hamilton completed her neurosurgery residency at the University of Wisconsin, followed by a fellowship in pediatric neurosurgery at Emory University.



Dominique Higgins, MD, PhD

Director, Adult Neurosurgical Oncology | Assistant Professor
Clinical specialty: brain tumors

Dr. Higgins is a neuro-oncologist, surgeon scientist, specializing in the treatment of brain tumors. His lab-based research in the Higgins Lab focuses on the treatment of malignant brain tumors, including glioblastoma, and is involved in various brain tumor clinical trials on campus. Dr. Higgins was selected as a Recipient of the Ronert A. Winn Diversity in Clinical Trials Career Development Award. He was also selected as a member of the Section on Tumors Research and Neurosurgery Research Education Fund (NREF) subcommittee.



Edward Yap, MD

Assistant Professor | Wellness Coordinator
Clinical specialty: cerebrovascular disease

Dr. Yap specializes in neuroendovascular and cerebrovascular surgery. After completing his residency at UNC Health, Dr. Yap completed a fellowship in neuroendovascular surgery at the University of Wisconsin in Madison. He currently treats patients with brain aneurysms, carotid disease and other cerebrovascular diseases, idiopathic intracranial hypertension, and NPH. His research interests involve minimally invasive clot evacuation and stroke disorders.

WELCOME DR. KIMBERLY HAMILTON

The Department of Neurosurgery would like to announce the addition of pediatric neurosurgeon, Dr. Kimberly Hamilton. Dr. Hamilton joined the Department of Neurosurgery faculty from West Virginia University in January 2025. She will be an incredible asset to the pediatric neurosurgery team.

PHYSIATRIST

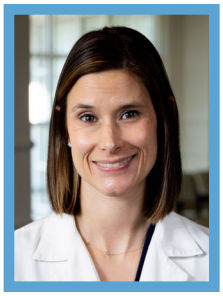
Kevin Carneiro, DO

Associate Professor of Neurosurgery and Physical Medicine Rehabilitation
Clinical specialty: non-interventional spine care

ADVANCED PRACTICE PROVIDERS

Kristi Hildebrand MSN, CPNP-AC, CNRN

Pediatric Nurse Practitioner
Clinical Instructor
APP Supervisor, Children's Surgery



Lindsay Thorp, FNP-BC

Nurse Practitioner

Megan Quinn, FNP

Nurse Practitioner

Casey Clarke, PA-C

Physician Assistant

Susan Cavanaugh, ACNP

Nurse Practitioner

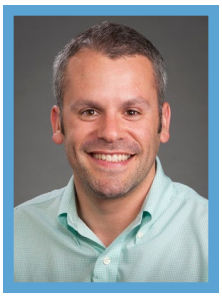
INTERNAL ADJUNCT FACULTY

Varnia Boerwinkle, MD

Kevin Brown, MD

Shawn Hingtgen, PhD

Albert Hinn, MD



David Kram, MD

Winnie Lau, MD

Moe Lim, MD

Jason Mihalik, PhD

Richard Murrow, MD

Yasmeen Rauf, MD

Brent Senior, MD

Casey Olm-Shipman, MD

J. Keith Smith, MD, PhD

Sten Solander, MD

Brain Thorp, MD

Amol Yadav, PhD, MS

Theodore Yanagihara, MD

Qian-Zhou (JoJo) Yang, MD

EXTERNAL ADJUNCT FACULTY

- **Anthony Asher, MD** – Atrium Health
- **Adam Back, MD** – UNC Charlotte
- **Adam Brown, MD** – Novant Health
- **Dawn Kernagis, PhD** – DEEP
- **Michaux Kilpatrick, MD** – Novant Health
- **Joseph Licata, PA-C** – Novant Health
- **Robert Oxford, MD** – Mission Health
- **Joseph David Stern, MD** – University of Michigan Health

NURSES

Katie McDaniel, MSN, RN

Nurse Coordinator, Spine/Nerve Surgery

Kelsey Wertman, BSN, RN, SCRN

Functional Neurosurgery Nurse Coordinator

Kimberly Miller, RN

Neurosurgery Oncology Nurse Navigator

David Baker, MSN, RN, AGCNS-BC, SCRN

Nursing Coordinator, UNC Pituitary Center

Jessica Sangutei, MSN, RN

Nursing Coordinator, Pediatric Neurosurgery

Tabitha Eure, BSN, RN

Nurse Manager, ACC

NEUROSCIENCES NURSES

Mallory Webb, MSN, RN, CNL

Patient Services Manager III

Crystal Norton, BSN, RN-BC, SCRN

Nurse Manager

Sonya Lester, BSN, RN, CCRN

Nurse Manager

RESEARCH

Kerry C. Roby Jr., PhD
Project Manager

Heather Ward, CCRC
Senior Clinical Research Coordinator

NEUROSURGERY STAFF

LEADERSHIP

Gene Hobbs, MBA, CHSE
Business Manager

Jim Murphy, MHA
Associate Chair for Administration

SKILLS LAB

Crystal Lincoln ST, CBCS
Skills Lab Manager

RESIDENCY PROGRAM

Kelly Lanier, MBA
Residency Program Coordinator

COMMUNICATION

Makenzie Hardy
Marketing Coordinator

MEDIA TEAM

Mark Schornak, MS, CMI
Medical Illustrator

Xian Boles, MFA, CMI
Medical Illustrator/3D Animator

Kurt Nolen, SOC
Medical Photographer/Videographer

OFFICE ADMINISTRATION

Executive Assistants:

- **Samantha Ray**
- **Tiffany Chrisco**

Maura Walter
Administrative Associate

Shelbi Carroll
Executive Assistant

National Board and Committee Appointments

- **Dr. Nelson Oyesiku** elected as President of the World Federation of Neurosurgical Societies
- **Dr. Nelson Oyesiku** elected as President-Elect of the American Academy of Neurological Surgery
- **Dr. Nelson Oyesiku** selected as President of the Brain Tumor Foundation
- **Dr. Soma Sengupta** nominated as committee member of the British Neuro-Oncology Society
- **Dr. Cheerag Upadhyaya** selected as Chair Elect of the Scoliosis Research Society's Health Policy Committee
- **Dr. Soma Sengupta** selected as Associate Editor of Clinical Medicine
- **Dr. Carlos David** selected as Vice President of University Neurosurgeons
- **Dr. Dominique Higgins** selected as a member of the Section on Tumors NREF subcommittee
- **Dr. Soma Sengupta** selected as Co-chair of the AANS/CNS Section on Tumors and Medical Neuro-Oncology Subcommittee
- **Dr. Soma Sengupta** nominated to the advisory board of StachStrong
- **Dr. Carlos David** selected as part of the Chair Nominating Committee of the World Federation of Neurosurgical Societies
- **Dr. Soma Sengupta** joined the American Brain Tumor Association alumni network
- **Dr. Cheerag Upadhyaya** selected to join the AANS/CNS Neurosurgery Quality Council
- **Dr. Cheerag Upadhyaya** selected to join the Medicare Evidence Development & Coverage Advisory Committee
- **Dr. Atil Kargi** selected as Chair for the Pituitary, Gonad, Adrenal and Neuroendocrine Disease State Network of the American Association of Clinical Endocrinology
- **Dr. Carlos David** appointed as Chair of the CME Committee of the AANS
- **Dr. Carlos David** appointed to the Education Committee of the AANS
- **Dr. Carlos David** appointed to the Scientific Program Committee of the AANS
- **Dr. Soma Sengupta** selected as Bye Fellow at the University of Cambridge, Lucy Cavendish College
- **Dr. Soma Sengupta** selected as a fellow of the Executive Leadership of Academic Medicine at Drexel University
- **Dr. Cheerag Upadhyaya** selected as a CNS AMA CPT Advisor
- **Dr. Cheerag Upadhyaya** selected to join the Scientific Program Committee for the AANS/CNS Joint Section on Disorders of the Spine & Peripheral Nerves
- **Dr. Cheerag Upadhyaya** selected as President of the American Association of South Asian Neurosurgeons
- **Dr. Cheerag Upadhyaya** invited to serve on the JNS Editorial Board
- **Kristi Hildebrand** selected as APP Supervisor for Children's Surgery
- **Dr. Michael Galgano** invited member of the AO Spine Tumor Knowledge Forum
- **Dr. Cheerag Upadhyaya** selected as Media Chair for the AANS/CNS Joint Section on Disorder of the Spine & Peripheral Nerves
- **Dr. Cheerag Upadhyaya** appointed to the IMAST Abstract Review Committee
- **Dr. Cheerag Upadhyaya** selected as a member of the AANS/CNS Joint Section on Disorders of the Spine & Peripheral Nerves

Awards

- **Dr. Nelson Oyesiku** received the Congress of Neurological Surgeons' Distinguished Service Award
- **Dr. Dominique Higgins** selected as recipient of the Robert A. Winn Diversity in Clinical Trials Career Development Award
- **Dr. Dominique Higgins** received the NRCDP Award
- **Dr. Vibhor Krishna** awarded Best Poster Award for Functional Neurosurgery at 2021 CNS Annual Meeting
- **Dr. Scott Elton** and residents received Top Poster Award at the 2021 Peds Section Meeting
- **Dr. Kevin Carneiro** selected for the North Carolina Business Magazine's Top Doctors List
- **Dr. Soma Sengupta** selected as Mayfield Scholar by the Mayfield Education & Research Foundation
- **Dr. Carlos David** awarded Presidential Citation from the American Neurotology Society
- **Dr. Soma Sengupta** received the Leonard Tow Humanism Award
- **Dr. Soma Sengupta** received the Unsung Hero Award from Cancer F amily Care
- **Dr. Kevin Carneiro** selected as Top Doctor in *Business North Carolina* 2021-2023
- **UNC Health** Received the Healthgrades 100 Best Hospitals for Spine Surgery Award
- **Dr. Soma Sengupta** awarded the title of Honorary Fellow from the University of Edinburgh
- **Dr. Cheerag Upadhyaya** selected for the Castle Connolly Top Doctors List 2023-2025
- **Dr. Cheerag Upadhyaya** selected in the inaugural SRS L.E.A.D Cohort

Message from the Vice Chair of Inpatient Operations, Dr. Vibhor Krishna

At UNC Health, we embody the essence of Carolina Care - treating every patient as we would our own family. This year has been transformative with the opening of the North Carolina Surgical Hospital, featuring 26 surgical spaces and 80 private rooms. This state-of-the-art facility, equipped with the latest technology, enhances our ability to deliver exceptional surgical care to more patients who choose UNC Health as their healthcare partner.

The spirit of Carolina Care is exemplified daily by our dedicated healthcare teams. Countless patients have shared stories of how our physicians and nursing staff went above and beyond their expectations, creating an environment of comfort and compassionate care. Our inpatient nursing team demonstrates this commitment consistently, ensuring each patient receives personalized attention focused on their recovery. This patient-first approach unites us as Team UNC, where every decision and action is guided by what is best for patients in our care.

Understanding that recovery continues beyond the hospital walls, we have developed comprehensive support systems. Our team ensures patients feel confident upon discharge, providing extensive resources and direct contact information for questions during home recovery. We've also implemented telehealth appointments for routine post-operative consultations, making follow-up care more accessible and convenient for our patients.

Our commitment to patient-centered care is further strengthened through our multidisciplinary approach. Nurse navigators and coordinators serve as dedicated guides throughout the treatment journey, coordinating everything from initial appointments through surgery, post-operative care, physical therapy, and rehabilitation. For complex cases like brain and spine tumors, this coordinated care approach ensures seamless treatment delivery while minimizing unnecessary hospital visits.

Demonstrating our commitment to operational excellence, many faculty members have pursued business administration degrees to enhance patient access and streamline hospital operations. This combination of clinical expertise and operational knowledge allows us to continuously improve our service delivery while maintaining our focus on exceptional patient care.

The essence of Carolina Care unites us in our mission to provide outstanding healthcare, reminding us daily that we're not just treating patients – we are caring for our neighbors, our community, and our family.

Message from the Vice Chair of Outpatient Operations, Dr. Cheerag Upadhyaya

This year marks the two-year anniversary of the UNC Department of Neurosurgery's consolidated clinic at the University of North Carolina Chapel Hill campus. For the first time, this state-of-the-art facility brought together all outpatient clinical services, including neuro-oncology, spine, functional, pediatrics, trauma, peripheral nerve, and cerebrovascular specialties, under one roof. This integration has fostered collaboration among providers, streamlined patient care, and significantly enhanced the patient experience.

Building on this foundation, we launched a new Multidisciplinary Neuro-oncology Clinic, bringing together providers from neuro-oncology, neurosurgery, and radiation oncology to deliver comprehensive and coordinated care. Our Multidisciplinary Pituitary Center continues to provide specialized care for patients with complex pituitary disorders, reflecting our ongoing commitment to multidisciplinary excellence and integrated treatment planning.

Over the past two years, we have expanded our team by recruiting two advanced practice providers to meet increasing clinical demands. Additionally, we have onboarded outpatient surgical nurse coordinators dedicated to spine, neuro-oncology, functional, and pituitary care, ensuring seamless care coordination and improving outcomes for our patients.

Our emphasis on improving access has yielded significant reductions in time-to-access for new patients while increasing outpatient volumes. Furthermore, we have refined key outpatient neurosurgery operations, including revenue cycle management, pre-authorization workflows, referral triage, and patient satisfaction initiatives. These efforts are integral to our mission of delivering high-quality, efficient, and patient-centered care.

As we celebrate this milestone, we remain steadfast in our commitment to innovation and excellence, ensuring that every patient receives the exceptional care they deserve.

NORTH CAROLINA SURGICAL HOSPITAL

In the summer of 2024, after five years of construction, UNC Health opened the North Carolina Surgical Hospital. The seven-story building has 375,000 square feet of space with 26 surgical spaces and 80 private rooms. The surgical suites include equipment used in newly developed procedures to ensure that patients receive the best surgical care possible.

Message from the Vice Chair of Hillsborough Operations and Chief Quality Officer, Dr. Michael Galgano

Over the past year two years, we have made significant improvements to our monthly morbidity and mortality (M&M) conference for both faculty and residents. At the root of these changes is a focus on accountability. We have implemented a system that ensures all M&M cases are thoroughly captured and discussed in a more streamlined and efficient manner, allowing ample time for respectful, open discussions about complications.

One key change I've introduced is having the resident assigned to each case also be responsible for creating slides and gathering relevant information, rather than relying solely on one chief resident to handle this each month. This approach not only spreads the workload across the resident team, but also fosters a sense of personal accountability.

A key focus of my academic work outside of the operating room has been the development of a comprehensive surgical video library. By reviewing footage from recently completed surgeries during weekly didactic sessions, residents and faculty have the chance to examine the finer details of surgical technique, improve quality, and share insights with those not directly involved in the procedure. In recent years, video-based education has become a cornerstone of training in many surgical fields, offering advantages that text and static images cannot match. Highdefinition surgical recordings allow trainees to visualize critical steps and complex anatomy, enhancing both learning and understanding.

Encouraging our surgeons to document their procedures through video can significantly improve outcomes in all aspects of neurosurgery by providing new avenues for training, skill development, and surgical decision-making. These videos also support preoperative planning by enabling surgeons to review challenging anatomical structures and innovative approaches, which can positively influence the outcome of upcoming cases.

Several neurosurgery residents and medical students have worked with me to edit and narrate surgical videos for academic publication. This collaboration not only extends our impact on education, but also contributes to quality care beyond UNC Health. A repository of published intraoperative videos offers surgeons at all levels the opportunity to expand their surgical repertoire by gaining exposure to operations and anatomy that might otherwise be inaccessible.

Looking ahead, my goal is to continue implementing changes that will optimize patient care and reinforce our commitment to patient safety.

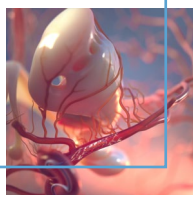
$2,517,995.29 Grant Funding

Almost **8,000** surgical cases from July 2021 through present

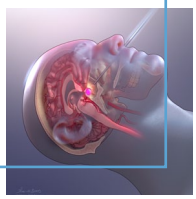
112 Publications

DIVISIONS

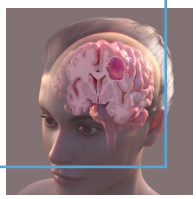
CEREBROVASCULAR & ENDOVASCULAR



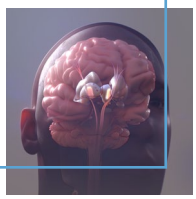
PITUITARY TUMOR & SKULL BASE SURGERY



NEURO-ONCOLOGY

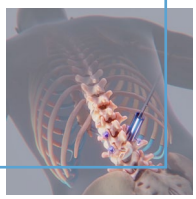


FUNCTIONAL NEUROSURGERY

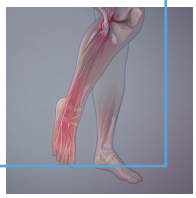


PEDIATRIC NEUROSURGERY

SPINAL NEUROSURGERY



PERIPHERAL NERVE SURGERY



CEREBROVASCULAR & ENDOVASCULAR

Patient with Family History of Brain Aneurysms has Successful Aneurysm Surgery

January 6, 2025

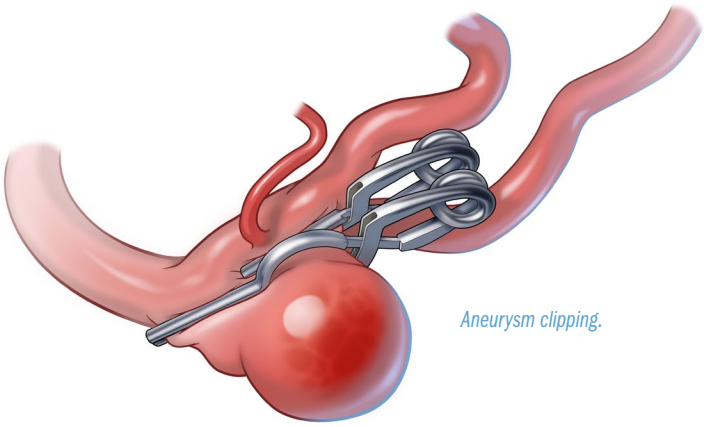
In 2012, Debra had trouble with her vision and went to see her eye doctor. She was referred to a neuro ophthalmologist and an MRI showed that Debra had an aneurysm pushing on her optic nerve.

Debra was no stranger to the dangers of brain aneurysms. Her father passed away at the age of 39 due to a brain aneurysm rupture. Although it is considered uncommon, a family history of brain aneurysms can increase a patient's risk of developing a brain aneurysm. Routine screenings are encouraged for patients with a family history of cerebral aneurysms.

Debra was referred to UNC Health for further evaluation and treatment for her aneurysm. She was treated by Dr. Sten Solander in the Department of Radiology using a less invasive method in which coils are placed in the aneurysm through a catheter in a blood vessel. After her procedure, Debra was told she had an artery disease that increases her chances of developing more brain aneurysms, and that she also had two small aneurysms that would be monitored by her care team with annual MRI appointments.

Debra continued with her annual imaging appointments until the pandemic hit in 2020. Because of the pandemic, Debra started to spread out her appointments to every other year. In 2024, she was retired and enjoying life with her husband and had not been in for an MRI in two years. Knowing her health history, her family doctor encouraged her to call and schedule an MRI, even though she felt healthy and had no symptoms. Debra called UNC Health to make an appointment, and was told that she would meet with a new physician, cerebrovascular and skull base neurosurgeon Dr. Carlos David, who had recently joined the Department of Neurosurgery.

On August 16, 2024 after an MRI and during her first appointment with Dr. David, Debra was told that the previously small aneurysm that was being monitored had grown significantly and needed to be surgically treated. Debra was surprised because she felt no symptoms or pain, and did not have vision trouble like her first aneurysm. Dr. David ordered further testing and scheduled an anteriogram, an imaging test that uses x-rays and contrast to see inside the arteries.



Aneurysm clipping.

The arteriogram confirmed the significantly larger aneurysm and that treatment would be necessary to prevent a rupture. Due to the location and irregular shape and size of the aneurysm, the treatment plan would be different from Debra's previous procedure. This aneurysm would require surgery. "He was so nice and I felt very comfortable," said Debra.

Debra went in for her surgery to clip the aneurysm. Dr. David was able to successfully secure and eliminate the aneurysm but noted many small blister-like areas on the nearby vessels. These potential weak spots and early aneurysms were too small to clip, so Dr. David relied on an older technique of "wrapping." The vessels were cocooned with a material called muslin which promotes inflammation and scarring, reinforcing the weak vessels.

While in recovery, Debra had the opportunity to meet nurse navigator Kim Miller. Kim managed all of the scheduling of Debra's appointments and called Debra before her surgery to go over pre-op instructions over the phone.

Debra was discharged later that day from the hospital. What she described as "discomfort" was easily managed by Tylenol. "I've had no pain," said Debra. "I haven't needed to take pain pills since I got home."

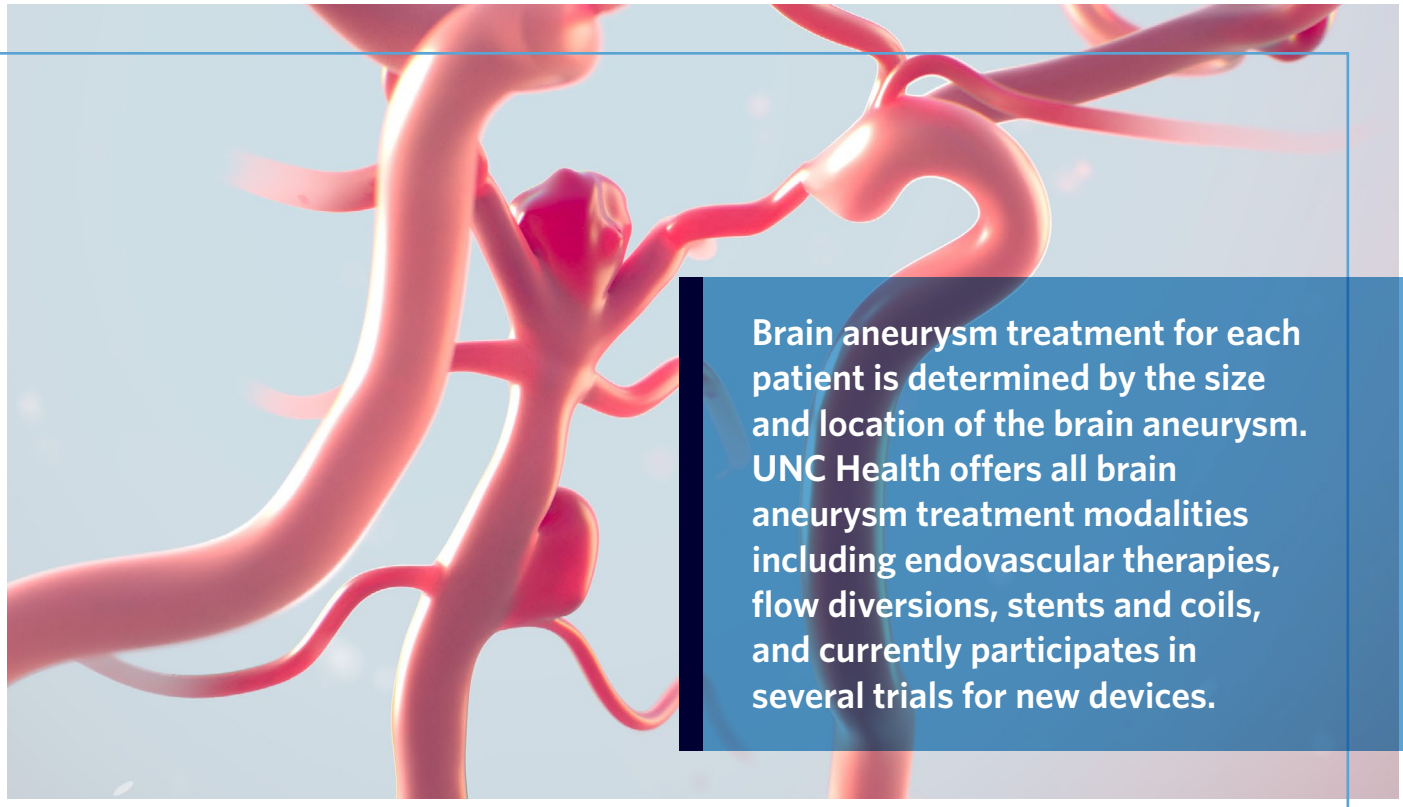
> **"I'm just so thankful for the medical expertise that is at UNC."**

Dr. David told Debra to expect to tire easily during her recovery. She was also cautioned not to bend to lift anything, and to avoid driving for three weeks. Despite these restrictions, she and her husband have not missed a beat and jumped right back into their normal routine, allowing time for extra rest when she feels tired. "I had surgery Tuesday afternoon and on Saturday we went out to eat and to church on Sunday," said Debra.

Two weeks after her surgery, Debra went back in to have her staples removed. "I couldn't be more pleased," said Debra. "I've had no side effects. The surgery went exactly how he told me it would be."

Debra was also pleased that she was able to keep her hair since Dr. David prefers not to shave the head, but rather clips a small amount of hair behind the hairline thus keeping the incision hidden. "You can't even tell that I had surgery," said Debra.

Debra plans to resume her annual MRI visits and will attend appointments with Dr. David once a year to monitor for potential new aneurysms. "I'm just so thankful for the medical expertise that is at UNC," said Debra. "From everybody that came to my bedside from pre op to registration, I couldn't have asked to be treated any nicer."



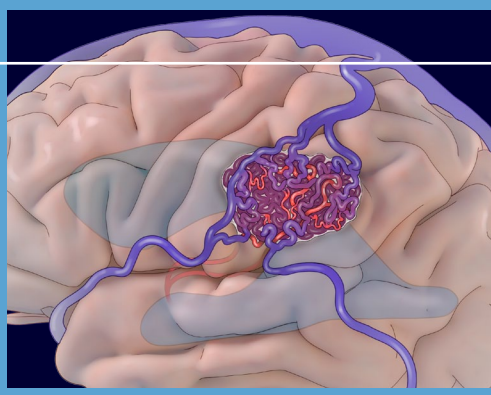
Brain aneurysm treatment for each patient is determined by the size and location of the brain aneurysm. UNC Health offers all brain aneurysm treatment modalities including endovascular therapies, flow diversions, stents and coils, and currently participates in several trials for new devices.

CEREBROVASCULAR AND ENDOVASCULAR DIVISION HIGHLIGHTS

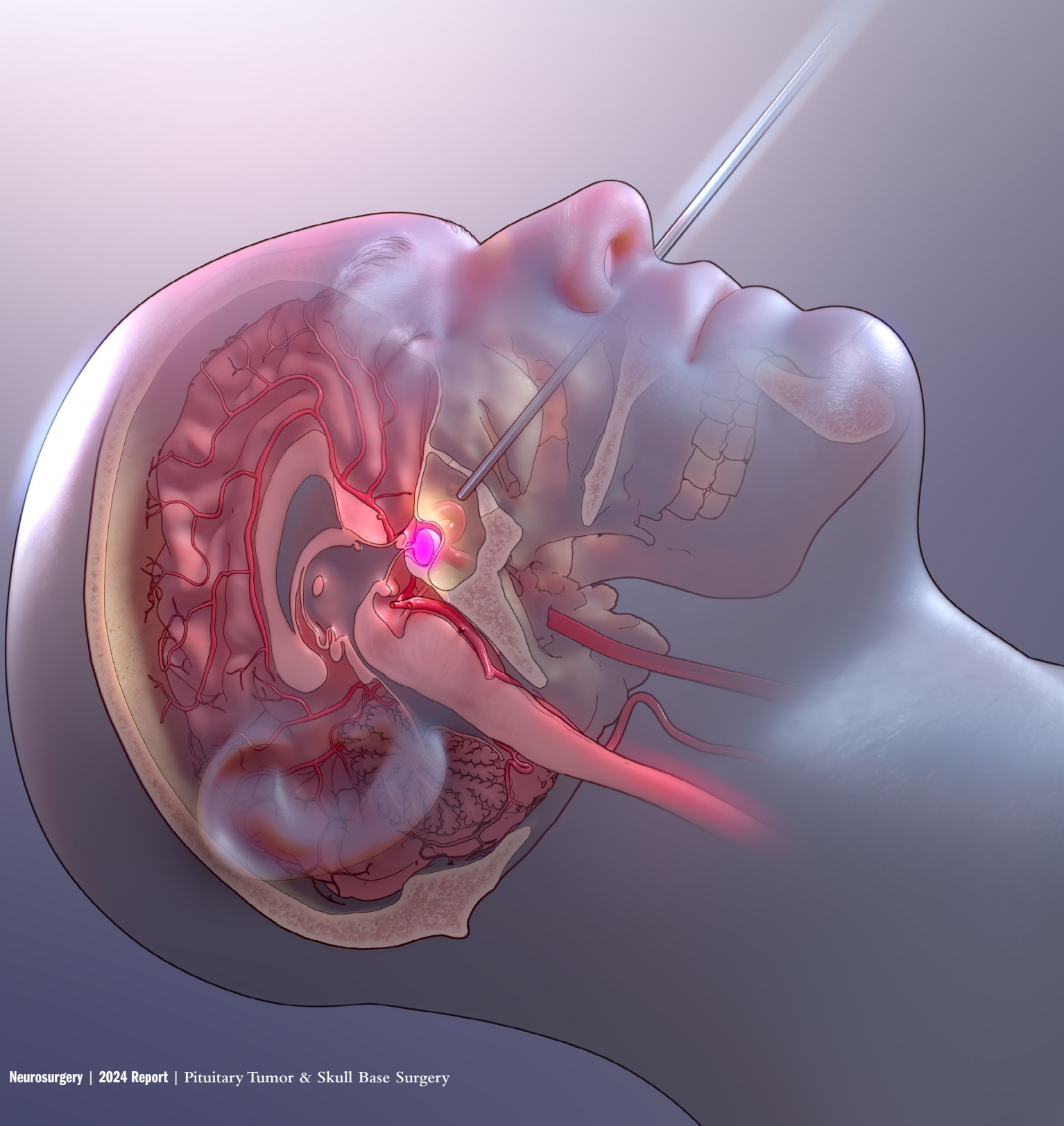
UNC Health's multidisciplinary cerebrovascular team offers surgical expertise in a wide range of procedures, from standard pathologies, such as AVM and aneurysm treatment, to more innovative treatments including venous sinus stenting for idiopathic intracranial hypertension, and middle meningeal artery embolization for chronic subdural hematoma.

The Comprehensive Stroke Center at the UNC Medical Center is a multi-specialty clinical and research program that incorporates state-of-the-art approaches in caring for patients with stroke or other vascular disorders of the brain.

The UNC Medical Center has a strong track record of quality and excellence in stroke care and has been awarded with the *Get with the Guidelines Gold Plus Achievement Award* from the American Heart Association.



PITUITARY TUMOR & SKULL BASE SURGERY



Pituitary Tumor Patient Receives Exceptional Care at the UNC Pituitary Center

November 21, 2024

Travis lived an active lifestyle, regularly training for triathlons and weight lifting. In 2019, Travis started to gain weight and experienced a lack of energy and daily fatigue. Combined with his sudden lack of drive and inability to recover in between workouts, Travis went to his primary care provider for answers.

Bloodwork confirmed that Travis had low testosterone. His primary care provider then referred him to a urologist. Additional bloodwork made the urologist suspect that a tumor could be causing the low testosterone, and Travis was referred to a neurosurgeon. An MRI confirmed the presence of a pituitary tumor, and Travis was then referred to the UNC Pituitary Tumor Center for treatment in April 2023.

The pituitary gland is located at the base of the brain and controls hormones throughout the body. Pituitary tumors can disrupt hormone production and can often go undetected for years. For Travis, his tumor was disrupting his testosterone levels causing his excessive weight gain, fatigue, and lack of motivation.

> **"The tumor is literally in the middle of the brain in a very tight, densely packed space surrounded by critical brain structures involved with blood supply of the brain, vision, hormone balance, and a host of metabolic functions essential for life."**

The UNC Pituitary Center offers streamlined care for patients with pituitary conditions, and provides comprehensive care combined with state-of-the-art diagnostic and therapeutic services through multidisciplinary collaboration. The center is led by world-renowned pituitary tumor surgeon and Chair of the Department of Neurosurgery at UNC Health, Dr. Nelson Oyesiku, who has performed over 4,000 pituitary tumor surgeries.

During his first appointment with Dr. Oyesiku, Travis was told that he had a craniopharyngioma, a rare, benign tumor on his pituitary gland. Craniopharyngiomas often involve the pituitary stalk, which connects the pituitary to the brain and transmits signals from an area of the brain called the hypothalamus to the pituitary gland. Since the hypothalamus is involved in appetite and body weight regulation, many patients develop a condition called hypothalamic obesity.

Dr. Oyesiku explained to Travis that for his specific case, the pituitary stalk may be interrupted in order to successfully remove the entire tumor. "Craniopharyngiomas are very difficult tumors to treat surgically," said Dr. Oyesiku. "The tumor is literally in the middle of the brain in a very tight, densely packed space surrounded by critical brain structures involved with blood supply of the brain, vision, hormone balance, and a host of metabolic functions essential for life."

UNC PITUITARY CENTER

The UNC Pituitary Center is a multidisciplinary center providing a comprehensive clinic dedicated to excellence for the care of patients with medical and surgical disorders of the pituitary gland, offering streamlined care for patients with pituitary conditions, including pituitary tumors. The UNC Pituitary Center is led by neuroendocrinologist Dr. Atil Kargi and pituitary tumor surgeon and Chair of the Department of Neurosurgery, Dr. Nelson Oyesiku.

The UNC pituitary tumor treatment team consists of leaders in each of their respective fields, ensuring that patients will receive the highest level of care with the best possible outcome when they choose UNC for pituitary tumor treatment and surgery.

Dr. Kargi's extensive training in the treatment of patients with diseases disrupting normal pituitary function makes him an incredible asset to the program. For some pituitary patients that meet certain criteria, they may be referred to Dr. Kargi to treat the tumor using medication, rather than having to undergo surgery. For patients that require surgical resection of a pituitary tumor, Dr. Kargi will manage the patient's medications perioperatively to ensure normal function of the pituitary gland after the tumor is removed.

> **"Dr. Kargi was very clear on what it would take to manage my care."**

Dr. Oyesiku explained his surgical plan to remove the tumor to Travis, and the benefits and risks of the surgery. "He was very clear about the diagnosis and upfront about what it would take to correct it," said Travis. "He told me it would be an invasive, high-risk surgery. I had a lot of questions and he answered every single one."

During his first visit to the UNC Pituitary Center, Travis also met with endocrinologist and co-director of the UNC Pituitary Center, Dr. Atil Kargi. Dr. Kargi explained that after surgery, there would be a sudden drop in production of several hormones. This condition is called hypopituitarism. "He was very down to earth and very caring," said Travis. "Dr. Kargi was very clear on what it would take to manage my care."

On April 24, 2023 Travis went in for an 8-hour surgery to remove the pituitary tumor. The procedure is known as an endoscopic, endonasal expanded transsphenoidal transplanum resection of a craniopharyngioma, and is done under general anesthesia. The surgical approach provides a minimally invasive, direct route through the nasal passage on both sides to the sinus at the back of the nose and then into the skull base, which is the gateway to the pituitary gland. Using an instrument called an endoscope that provides illumination, magnification, and fine surgical instruments, the surgeon can gain access to the tumor, and can identify and protect the critical structures in the region.

After his surgery, Travis stayed in the hospital for 10 days. "I couldn't have asked for a better care team or better resources," said Travis. "Dr. Oyesiku came nearly every day to check in and it was the highlight of my stay getting his updates."

A week after discharge, Travis started his postoperative endocrinology management with Dr. Kargi. It took almost a year for Travis to get back to his "normal" through adjusting his medications. Endocrinology management after surgery is different for every patient and takes time and effort to adjust all hormone medications carefully, observe responses, and then readjust medications. "The issue with this disease is that normally the hypothalamus and pituitary gland work together as a gauge of normal hormone levels and when that gauge is broken, it becomes challenging to know the exact doses or hormone levels to target, or the set points, for each hormone for each individual patient," said Dr. Kargi. "It is one of the most tedious and difficult things to do as an endocrinologist."

Travis needed five different hormone medications to replace the hormone deficiencies after surgery. "This acute change of hormones and need to start many medications in a short period of time can be overwhelming for even the most resilient, resourceful, and prepared patients and medical teams," said Dr. Kargi.

> **"I feel better now than I ever have. I couldn't ask for anything better."**

Frequent blood tests, appointments, and careful attention to specific symptoms are crucial to a patient's recovery. "One reason Travis has done so well is that he is a great patient," said Dr. Kargi. "He is on top of things and always follows up and asks questions and takes his medications and does his labs," said Dr. Kargi.

Dysfunction of Travis's hypothalamus caused him to develop hypothalamic obesity (HO), which caused dramatic weight gain after the tumor was removed, despite aggressive hormone replacement. Travis was treated with a nutritionist and exercise program and a weekly injection. "I meet with Dr. Kargi every quarter," said Travis. "He's fantastic."

Now, Travis is back at work full time and back to his active lifestyle. He's working out and noted a significant improvement in his strength. He is still working to lose weight, but is no longer gaining weight like he was before his surgery and his energy has returned. "Overall, I feel better than I did pre-surgery," said Travis. "I feel better now than I ever have. I couldn't ask for anything better."

SKULL BASE SURGERY

The Skull Base Surgery Program at UNC School of Medicine is a state-of-the-art, multidisciplinary center that delivers cutting-edge care for complex cranial base pathologies. The program excels in managing anterior cranial base conditions, endoscopic skull base surgeries, lateral skull base procedures, and acoustic neuroma surgeries. Through close collaboration with specialists in neuro-oncology, radiation therapy, and radiosurgery, the team provides comprehensive, personalized treatment plans.

This advanced program integrates expertise across disciplines to ensure optimal outcomes for patients with challenging skull base tumors and disorders.

NEURO-ONCOLOGY

Glioblastoma Patient Joins the Sonobird Clinical Trial at UNC Health

November 20, 2024

Lynn lives an active lifestyle as an owner of her own luxury traveling tours business. But when she got back from a corporate cruise in November of 2023, she started to feel sick every day.

Lynn was quick to dismiss her feelings of unwellness and weight loss, assuming that her new diet was to blame. Then she started to notice problems with her memory. In February of 2024, she was out shopping with her granddaughter when she started struggling with her speech. "She kept telling me she couldn't understand what I was saying," said Lynn. "I couldn't talk. I called my husband and he came straight to where I was and took me to UNC Rex in Raleigh."

Lynn's husband thought she had had a stroke, and she was immediately rushed back when they reached the emergency room at UNC Rex. Within two and a half hours on February 19, 2024, they were told that she had a large brain tumor.

Lynn stayed in the hospital at UNC Rex and had the tumor removed by neurosurgeon Dr. Sivakumar Jaikumar. When she was discharged, she was referred to division chief of neuro oncology, Dr. Soma Sengupta, at UNC Health Chapel Hill for treatment.

A bad case of food poisoning prevented Lynn's husband from accompanying her to her first appointment at UNC Health in Chapel Hill. Thankfully, Lynn met nurse navigation Ann Dixon at her first appointment. "Had it not been for meeting Ann that first day, it would not have been as positive," said Lynn.

Dr. Sengupta informed Lynn about ongoing glioblastoma clinical trials at UNC Health. Lynn felt overwhelmed by her diagnosis, the clinical trials, and the absence of her husband during her appointment, and decided to decline participating in any of the clinical trials and move forward with standard of care treatment.

BRAIN TUMOR TREATMENT AT UNC HEALTH

UNC Health's multidisciplinary neuro-oncology clinic offers streamlined, high-quality care for patients with brain tumors and spine tumors.

UNC Neurosurgery faculty members will collaborate with other specialists at UNC Health to provide comprehensive care for all patients treated at the neuro oncology clinic. This team approach will allow our physicians to address each individual patient's needs, and then make an informed decision on the most effective treatment. The new clinic, located on the third floor of the UNC Ambulatory Care Center, will make it easier for patients to schedule their appointments.

UNC Health offers integrative medical groups visits for patients who would like to connect with other brain tumor patients at UNC Health. Integrative medical group visits provide patients with information on important topics, such as nutrition and exercise, that can benefit patients with brain tumors and other neurological diseases.

UNC Health continues to adapt cutting edge technologies including GammaTile therapy and focused ultrasound to improve patient outcomes, and was the first hospital in North Carolina to offer Quicktome™, an FDA-cleared precision brain mapping platform designed to visualize a patient's unique brain networks prior to life-changing surgery.

"Dr. Sengupta was wonderful," said Lynn. "She let me tell my story and she was kind enough to let me have my treatment in Rocky Mount."

The standard of care for glioblastoma patients after resection surgery includes chemotherapy and radiation, which Lynn was able to do at UNC Health Nash in Rocky Mount. She traveled to Italy in between treatments to lead two of her group tours. After she returned to continue treatment, her headaches returned. Worried, Lynn reached out to Dr. Sengupta. "Dr. Sengupta was going out of town, so she set me up with Dr. Higgins and Dr. Rauf," said Lynn.

Neurosurgical oncologist Dr. Dominique Higgins and neuro oncologist Dr. Yasmeen Rauf met with Lynn to explain that MRI imaging confirmed her tumor was growing, and the standard of care treatment was not working. She would have to undergo another resection surgery.

Still a candidate for the clinical trials, Dr. Higgins and Dr. Rauf provided Lynn with a detailed document outlining the ongoing glioblastoma clinical trials at UNC Health and spoke with her at length about each trial. After spending time reading about the clinical trials, Lynn decided to enroll in the SONOBIRD phase III clinical trial for patients with glioblastoma. The trial is led by Dr. Higgins. "Dr. Higgins was very honest and I understood what he was saying," said Lynn. "I asked him point blank questions that he answered very honestly. He gave me his card, and told me if I needed anything to contact him."

For this clinical trial, following her tumor resection, Lynn takes a dose of the medication once every six weeks, and she will have an MRI and bloodwork in between doses to monitor tumor growth. "There are so many trials out there and with the type of GBM I've got, this is the best option," said Lynn.

On September 11, 2024, she went in for her second surgery performed by Dr. Higgins at UNC Health in Chapel Hill. During the surgery, Dr. Higgins was able to perform a maximal safe resection of the new tumor growth from around critical nerves and blood vessels. "Lynn's journey highlights the quality and collaborative care provided at UNC," said Dr. Higgins. "We are excited to be the first center in the US to offer this clinical trial, and the only site in North Carolina, which allows us to provide these cutting-edge options for our patients."

Radiation oncologist Dr. Colette Shen with neurosurgical oncologist Dr. Dominique Higgins.

Lynn and her husband with her UNC Health care team: Dr. Soma Sengupta, Camisha Johnson, CRC, Dr. Dominique Higgins, and Chaeyeong Jang, PharmD.

In addition to her treatment at UNC Health, Lynn also participates in integrative oncology group visits led by Dr. Sengupta. The virtual visits provide brain tumor patients with information on important topics, such as nutrition and exercise, that can benefit patients with brain tumors. Dr. Susan Gaylord, Amanda Corbett Pharm D, Denise Spector NP, and Aisha Chilcoat ND, all provide their expertise in this integrative oncology virtual group visit series.

> **"Dr. Sengupta's collaborative group has been unbelievably positive," said Lynn.**

Lynn shared that she has made a conscious effort to incorporate mindfulness and positivity into her life through healthy diet, yoga, meditation, and by masking in public spaces when she needs to go out to prevent illness. "This has been very, very difficult," said Lynn. "But trying to put positivity in has made a difference."

NEUROFIBROMATOSIS PROGRAM AT UNC HEALTH

UNC Health has a Children's Tumor Foundation credited neurofibromatosis (NF) program. Most of our patients have NF1, but our providers also see NF2 patients. Faculty members participate in the NF Children's Tumor Foundation meetings and participate in the Shine a Light NF Walk each year. The NF program at UNC Health was formed by Dr. R. Greenwood, and is currently co-run by Dr. Eric Creed and Dr. Soma Sengupta. Dr. Sengupta (adult) and Dr. Kram (pediatric) are both neuro-oncology clinical trialists, and both have run clinical trials for NF patients.

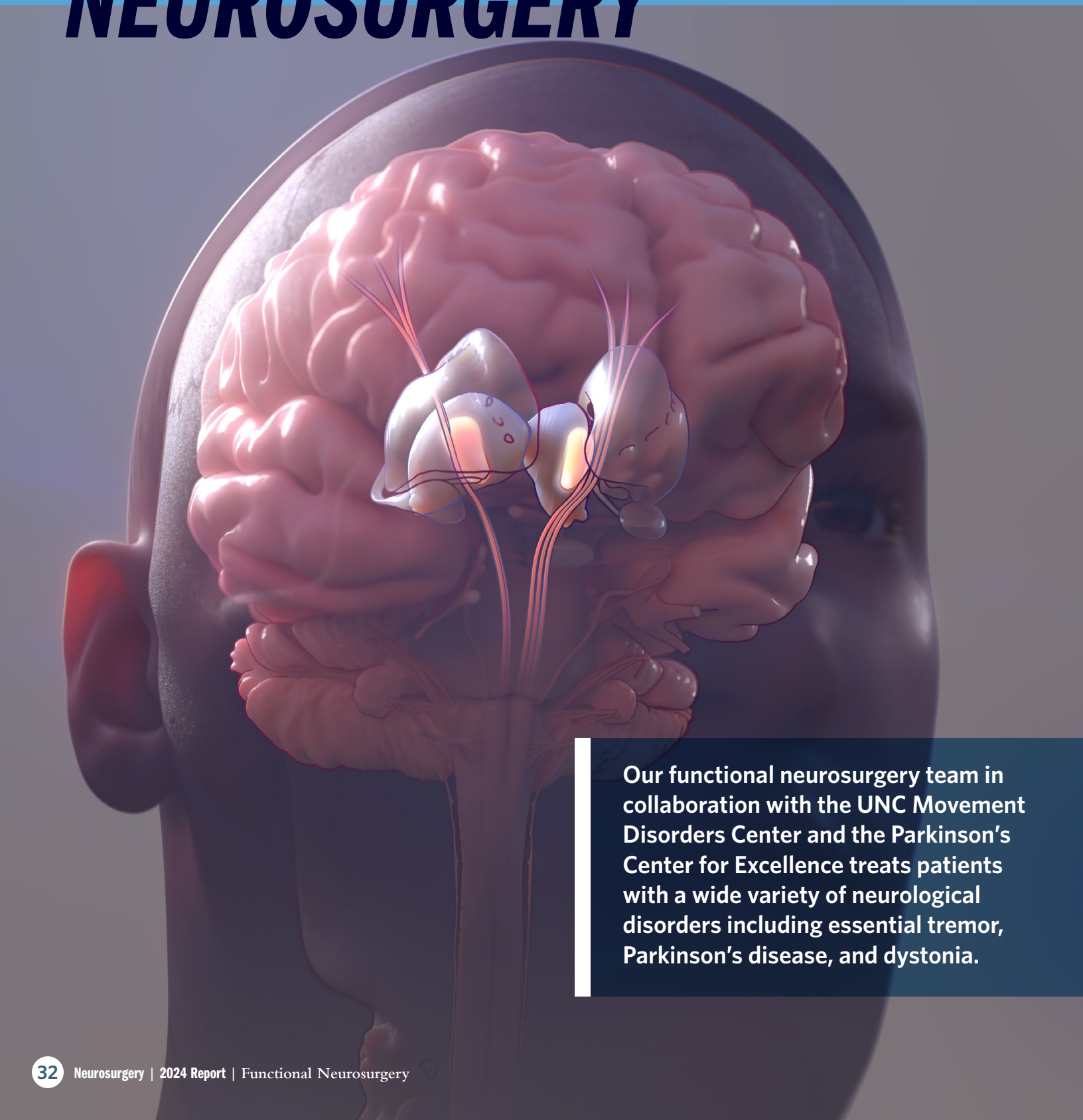
OUTSIDE THE HOSPITAL

In addition to their research and patient care, our brain tumor physicians spend time sharing their expertise at conferences and during presentations, advocate on behalf of brain tumor patients on Capitol Hill, and actively participate in leadership and membership roles for many different brain tumor organizations. Our brain tumor team also participates in the planning of the NC Triangle Head for the Cure race each year to raise money for brain cancer research.

Dr. Soma Sengupta also provides valuable information for patients and caregivers at various speaking engagements. Dr. Sengupta was invited to speak to patients and caregivers at the 2024 American Brain Tumor Association Caregivers Conference. She has also led multiple webinars highlighting well-being for patients and caregivers.

Dr. Sengupta also organized the Weatherspoon Inaugural Brain Tumor Mini-Symposium, convening experts in pediatric neuro oncology and featured Dr. Timothy Gershon from Emory School of Medicine. Dr. Dominique Higgins and Dr. Yasmeen Rauf also presented their research. The 2025 Weatherspoon Symposium will feature keynote speakers Dr. Jeremy Rick, Deputy Director at UPMC Hillman Cancer Center, and Dr. Vinay Puduvalli, Professor and Chairman in the Department of Neuro-Oncology at MD Anderson Cancer Center.

FUNCTIONAL NEUROSURGERY



Our functional neurosurgery team in collaboration with the UNC Movement Disorders Center and the Parkinson's Center for Excellence treats patients with a wide variety of neurological disorders including essential tremor, Parkinson's disease, and dystonia.

Focused Ultrasound Treatment Enables Musician with Essential Tremor to Pick up the Guitar Again

March 10, 2024

Frank has spent his life writing and performing music. In his late teens, he noticed that his hands would shake before going out on stage to perform. Since the issue always resolved after the first song, he assumed the slight tremor was due to performance anxiety.

Over time as Frank's tremor progressed, he switched from playing the guitar to the bass. In his late 50's, he started to notice that feeling of nerves and anxiety in his hands occur when he was trying to eat. "My mother and her mother both had essential tremor," said Frank. "My mother had it severely, and I wondered if [my tremor] would progress."

Frank's tremor became increasingly debilitating. By age 60, Frank could no longer write his name. At this point, Frank was a scuba guide and instructor in the Caribbean and found that he could no longer fill out the paperwork for his clients. He could no longer shave without using two hands to prevent cutting his face and he could no longer lift a cup to take a drink without spilling.

> **"This was really impacting my ability to do basic things," said Frank. "I stopped going out to dinner and spending time with friends. It was so life diminishing for me and my wife.**

Frank started researching essential tremor and came across focused ultrasound treatment. Focused ultrasound (FUS) is an incision-less treatment for patients with movement disorders, including essential tremor, and can be an effective treatment options for patients who do not respond to medication.

Guided by real-time imaging, FUS can achieve precise and targeted ablation in the brain. During the FUS procedure, patients are awake and participate in testing. UNC Health is the only hospital in the country to offer an interdisciplinary tremor clinic, which brings together experts from neurology, neurosurgery, and rehabilitation services all during one appointment.

FOCUSED ULTRASOUND AT UNC HEALTH

UNC Health is one of the select few health systems in the United States to have a full spectrum of focused ultrasound equipment, both high-frequency (650 KHz) and low-frequency (220 KHz) focused ultrasound for image-guided brain surgery.

Dr. Vibhor Krishna is an early adopter of focused ultrasound and is responsible for building the focused ultrasound program at UNC Health. This program integrates state-of-the-art facilities at the Biomedical Research Imaging Center and expertise from clinicians and researchers across multiple disciplines throughout campus. Dr. Krishna has built a successful focused ultrasound program. This minimally invasive treatment is available to patients with medication resistant movement disorders, including essential tremor and Parkinson's disease.

Last year, Dr. Krishna and the focused ultrasound team organized a focused ultrasound open house event for patients, physicians, and leadership at UNC Health, thanking them for their continued support of the program.

Frank reached out to Dr. Vibhor Krishna, an expert in functional neurosurgery and neuromodulation, to undergo FUS treatment. Many patients choose to treat the side of the brain that corresponds with their dominant hand. After the procedure, Frank was pleased with the results and noticed a significant reduction in his right-hand tremor.

However, the left-hand tremor worsened over time, negatively impacting his ability to play music. "Treating both sides with focused ultrasound was not possible a few years ago," said Dr. Krishna. "We carefully undertook a multi-center trial to study the safety and effectiveness of staged bilateral FUS treatment. This trial showed FUS to be safe and effective in treating tremor symptoms in both hands and led to its FDA-approval."

When treatment for the second side of the brain became FDA-approved, Frank again reached out to Dr. Krishna, and traveled to Chapel Hill from his home in Portugal for the second side procedure.

Frank was most impressed by the real time results that he saw during the testing portion during and after his bilateral treatment. He was shocked by his ability to draw a straight line and follow the shape of a circle without shaking.

NEUROSURGERY FOR PAIN

At UNC Health, we offer a multidisciplinary approach to treating neuropathic pain and neuralgias with advanced techniques like Neuromodulation, CyberKnife, and microvascular decompression surgery, and were among the first in the southeast region to use Medtronic's Intellis platform for closed-loop spinal cord stimulation.

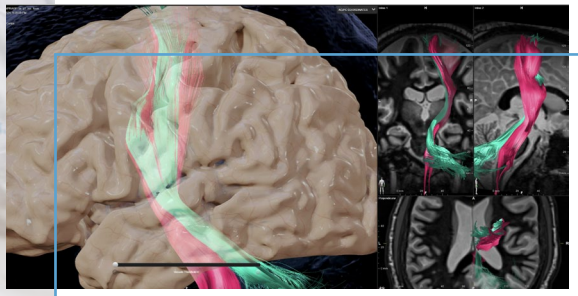
When he got home, Frank reached for his guitar. "I was able to play the guitar for my wife," said Frank. "She had never heard me play the guitar. It was such an important part of my life for so long, but she had never heard me play. It was such a magical moment of restoration and having my life back."

Frank also noted the small, every day improvements including being able to shave and brush his teeth. He can also now pick up a glass and drink without spilling.

Now Frank is doing well and enjoys spending time with his wife and playing music.

UNC EPILEPSY CENTER AND EPILEPSY SURGERY

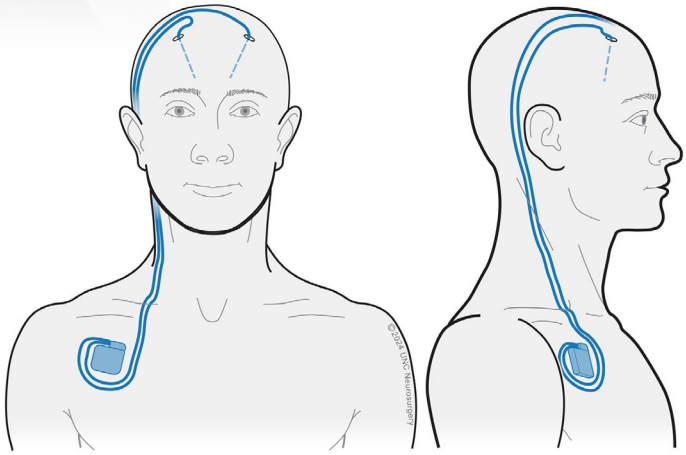
The UNC Epilepsy Center is the only center in North Carolina that utilizes resting state fMRI to localize seizures in epilepsy patients.. Dr. Eldad Hadar was the first neurosurgeon at UNC Health to use LITT (Laser Interstitial Thermal Therapy), a minimally invasive procedure to effectively treat seizures without the associated risks of open brain surgery. UNC Health leads in using Responsive Neurostimulation (RNS), a groundbreaking treatment that automatically detects and stops seizures, enhancing patients' lives.



DEEP BRAIN STIMULATION

UNC Health has offered the life-changing deep brain stimulation (DBS) treatment since 2004 and has since performed over 1,000 DBS surgeries. UNC Health's DBS program's physicians offer decades of experience in the field. DBS treatment is offered to patients with movement disorders including Parkinson's disease, essential tremor, and epilepsy, with promising outcomes for patients with obsessive compulsive disorder and dystonia.

We personalize each treatment plan through a collaborative, multidisciplinary approach, integrating the latest advances in device technology, neuroimaging, and more recently asleep DBS for optimal patient care.



PATIENT EDUCATION AND OUTREACH WITH INSIGHTEC

Over the past year and a half, Dr. Vibhor Krishna worked with INSIGHTEC to increase visibility of the focused ultrasound program at UNC Health. Through patient webinars, led by Dr. Krishna and Dr. Daniel Roque from the Department of Neurology, they have delivered patient education across the southeast region and beyond.

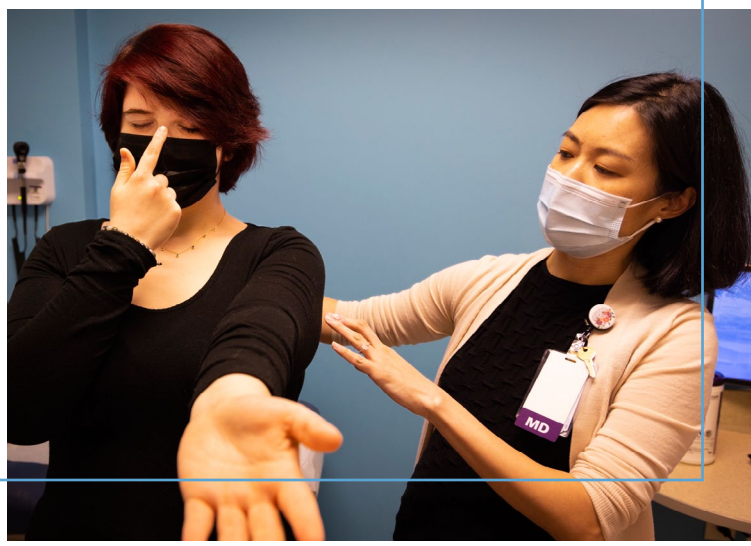
PEDIATRIC NEUROSURGERY

Pediatric Epilepsy Patient Enjoys Seizure-Free Life After Epilepsy Surgery at UNC Health

March 26, 2023

Coryzma experienced seizures for years before receiving a diagnosis. She described her seizures as feeling like déjà vu and at one point, Coryzma was having about five seizures a day, many times blacking out completely. Finally in seventh grade, Coryzma was diagnosed with epilepsy.

Coryzma's mother, Christina, chose to go to the UNC Epilepsy Center for treatment. The most common treatment method for epilepsy is medication, which can effectively control seizures for many patients. Unfortunately, the medications did little to control the frequency of Coryzma's seizures. "I had to switch medications a lot," recalled Coryzma. After Coryzma tried several medications, which caused frustrating side effects without success, her doctors at the UNC Epilepsy Center began evaluating her for epilepsy surgery.



With stereotactic encephalography (sEEG) and specialized brain imaging, the team identified that the seizures were coming from the left temporal lobe, an area of the brain where language and memory lives. "For epilepsy surgery, it's weighing the benefits and risks – of seizure freedom versus the risk of creating a new functional deficit due to surgery," said UNC pediatric neurosurgeon Dr. Scott Elton. "All of this is discussed with the family."

> **"She had no energy or drive to do anything else. Appointments were exhausting for her. She didn't want to participate with the family, go out, or partake in activities."**

Since the seizures were coming from a sensitive area of the brain, the team recommended implanting a neuro-modulation device to try and control Coryzma's seizures. During her first consultation with Dr. Elton, Coryzma felt at ease about the surgery. "He is really easy to talk to," said Coryzma. "He is very reassuring."

Coryzma's first surgery took place in January 2019. However, after surgery, Coryzma's seizures came back and the device had to be removed due to infection. At this point, Coryzma was still taking seizure medications and experiencing many side effects. This made it impossible for Coryzma to drive or get a job. Day to day life was becoming difficult as she struggled with anxiety and depression caused by her frequent seizures and medications. "She slept literally all day," said Coryzma's mother, Christina. "She had no energy or drive to do anything else. Appointments were exhausting for her. She didn't want to participate with the family, go out, or partake in activities."

It was back to the drawing board for the UNC Epilepsy Center team. "Epilepsy treatment is really a team sport," said Dr. Elton. In 2021, Coryzma consulted with pediatric epileptologist Dr. Qian-Zhou (JoJo) Yang. "Coryzma had a thorough evaluation with intracranial EEG in 2018 to locate the seizures," said Dr. Yang, Director of the UNC Pediatric Epilepsy Monitoring Unit. "We were able to look back at these EEGs and see that the seizures were in fact coming from a very small part at the bottom of the left temporal lobe. This area was not close to language or memory functions."

The UNC Epilepsy Center regularly holds internal conference meetings with each specialist present to discuss patient cases and to determine the best treatment for each patient. After reviewing all of Coryzma's MRI and PET exams, pediatric neuroradiologist Dr. Sheng-Che (Alex) Hung identified the abnormal brain region that matched the EEG abnormality found by Dr. Yang. Dr. Hung also evaluated the relationship between the abnormal brain region and the optic radiation using diffusion-tensor imaging and helped locate the target region on the navigation system. After thorough consideration, the multidisciplinary team recommended surgical removal of this small area of the left inferior temporal lobe, which would minimize the risk of any deficit to language or memory.

After years of seizures and dealing with debilitating anxiety and depression caused by medications, Coryzma was ready to try the surgery. "They told us the possible outcomes, possible therapies that may be needed after surgery," recalled Christina. "We had to take time to process the information. It was very overwhelming. Coryzma was mostly on board just for the hope of being seizure-free."

UNC CHILDREN'S HOSPITAL

UNC Health is the only hospital in North Carolina that offers a fetal surgery program.

UNC Children's is consistently ranked among the nation's top children's hospitals by the U.S. News & World Report and is consistently ranked in pediatric neurosurgery. Dr. Scott Elton, Pediatric Neurosurgery Division Director and Children's Hospital OR Medical Director oversees a broad clinical and academic practice covering numerous clinical endeavors.

Craniofacial care is a comprehensive part of the pediatric neurosurgery division. Dr. Elton is an active participant in the UNC Craniofacial Team, which combines multiple specialties to care for patients with a variety of craniofacial conditions. In addition to providing care, the multidisciplinary team also coordinate social services, including school accommodations and augmentative communication devices, speech and neuro-psych evaluations, and various medical appointments at UNC Health. Kristi Hildebrand, P-NP oversees an extremely busy plagiocephaly clinic, managing the evaluation and treatment of children with positional molding. All varieties of cranial reconstruction, from endoscopic assisted cranial remodeling to complex open cranial reconstruction, are available to patients who may benefit from these surgeries.

Dr. Elton is also a co-lead of the UNC Pediatric Epilepsy Center, working with a multidisciplinary team including child neurology, neuropsychology, and radiology. This team meets regularly to evaluate, discuss, and recommend further surgical evaluation and management strategies for children who have intractable seizure disorders. All forms of surgical intervention, from stereo encephalography to laser interstitial thermal therapy, device implantation, and open brain surgery are used in this program to achieve the best possible outcomes for these children. These technologies and the comprehensive team approach have changed the lives of many children.

Dr. Elton is a co-director in the Pediatric Neuro-Oncology program, in which he partners with pediatric oncologist Dr. David Kram. This is a comprehensive program with a broad multidisciplinary oncology team involving oncology, neurosurgery, radiation oncology, radiology, pathology, social work, and many others. The weekly neuro-oncology conference brings many children with different central nervous system tumors to discussion to then develop plans to care for this complex population. All forms of tumor care are available to these children, with an extremely family centric focus.

Dr. Elton has established numerous clinics in order to reach out to families, many of who struggle to travel long distances. He currently has clinics in Chapel Hill, Wilmington, and Raleigh. The surgical practice covers all aspects of pediatric neurosurgical care.

Our pediatric neurosurgery team uses the latest technology to care for our patients such as surgical robotics. With acquisition of the ROSA robotic platform, pediatric neurosurgery has made leaps in surgical care. The robot increases precision and efficiency of several types of surgery, reducing operative and anesthetic time, and reducing risk. Other technologies, including LITT and intraoperative CT, are used to provide the best outcomes for pediatric patients.

Coryzma's resection surgery took place in December 2021. Dr. Elton also performed a cranioplasty to replace the part of the skull that was lost due to infection. The surgery went extremely well without any complications. Coryzma stayed in the hospital for less than a week before being discharged.

> **"Things could not have been more perfect," said Christina.**

"Her recovery was smooth and relatively quick considering what she had been through. No therapies were needed. We came off one of her meds, which was when we saw the big change."

Coryzma also noted that all of the nurses and staff went out of their way to make her stay in the hospital as comfortable as possible. "They made sure everything was easy on my mom and made sure that she could relax," said Coryzma. "They were all very sweet."

After surgery, Coryzma was able to cut her seizure medications in half and stop her anti-depressant. "Our goal with epilepsy surgery is to be precise and accurate in identifying where the seizures come from," said Dr. Yang. "This gives the best outcome in terms of seizure control." Her care team at the UNC Epilepsy Center describe her as a completely different girl than she was before her last surgery. "Dr. Yang makes sure that I know everything I need to know when I go into my appointments," said Coryzma.

During Coryzma's last appointment with Dr. Yang, she was cleared to drive. Now that she is over one year seizure free, she has her first job. "We've got our girl back," said Christina. "She has drive, energy, sassiness. She wants to go back to school, work, and start being part of the family again. She's back to being an active teenager."

Coryzma now has the rest of her life to look forward to, without frequent seizures getting in her way. "She is the girl we knew before," said Christina.

> **"Of all the possible outcomes, we couldn't have asked for a better one."**

SPINA BIFIDA FAMILY DAY AND VIRTUAL CONFERENCE

Pediatric nurse practitioner Kristi Hildebrand P-NP, the neurosurgical liaison to the comprehensive spina bifida program, recognized that UNC patients with spina bifida would benefit from connecting with other spina bifida families at UNC. She conceived of and organized the UNC Spina Bifida Family Day. Fun activities for the children and their siblings, as well as inspirational speakers demonstrating the breadth of what was possible with spina bifida were a significant part of this event.

When the Covid-19 pandemic swept through the world, the Spina Bifida Family Day was at risk. With a desire to still connect the UNC spina bifida families and children during this crisis, she arranged a virtual Family Day. The virtual event, hosted in the fall of 2020 and again in 2021, included presentations from specialists across multiple disciplines.

When it was safe to hold the event in person again, Kristi organized the Spina Bifida Family Day event at a local park in the fall of 2022. The event was well attended by our spina bifida patients and their families.

SPINAL NEUROSURGERY

UNC Surgeons Collaborate on Care for Patient with Complex Head and Neck Cancer

January 3, 2025

In 2022, Eron began experiencing severe neck pain and difficulty holding her head in an upright position. She had developed a severe chronic spinal infection from leakage of her oral bacteria into the space around the spinal column in her neck, causing erosion and collapse of four vertebrae in her neck.

Eron's daughter Kelly describes her mom as stubborn, strong-willed, and independent. In 1995, Eron discovered a cancerous lump in her neck. Her care team in Florida treated her with the maximum dose of radiation in her entire head and neck to get rid of the cancer. The aggressive treatment damaged the tissue in Eron's neck that eventually required Eron to use a feeding tube.

When the Covid-19 pandemic hit in 2020, Eron was living alone in South Carolina. She started to struggle with swallowing and felt like something was stuck in her throat. When she looked in the mirror, Eron could see a mass starting to form in her neck. She went in for her annual check-up with her local ENT surgeon and had the mass biopsied. In July of 2020, Eron found out she had cancer again.

To remove the mass from her throat, the surgical team in South Carolina removed a significant amount of tissue from Eron's neck and left a thin layer of tissue covering her spine and her carotid arteries. The quality of Eron's tissue was so poor from her aggressive radiation treatment in 1995, that a flap graft used to cover her spine would not take, leaving the spinal column potentially exposed to bacteria from the oral cavity. "They said there's nothing more we can do for you," recalled Kelly. "They said it didn't heal well." Eron recalled being told that she was "too old to save" by another surgeon.

> **"We walked in and [Dr. Galgano] immediately said 'so nice to meet you, I have a plan.' I was thrilled."**

In 2022, Eron began experiencing severe neck pain and difficulty holding her head in an upright position. She had also developed difficulty maintaining balance while she was walking, and had a progressive loss of hand dexterity. She began having multiple bouts of aspiration from her challenges with swallowing. Kelly and her sister noticed that Eron would occasionally shuffle her feet and that it had become hard for her to hold her head up and get comfortable. When Eron moved to Florida to live with Kelly and her significant other Matt, an orthopedic surgeon, they took her in for imaging. Eron's scans showed that her spinal cord was being compressed. "We started researching and found Dr. Galgano," said Kelly. "I called his office and got a polite responsive human and they made us an appointment within 3 weeks."

Eron with Dr. Michael Galgano after her surgery.

Complex spine surgeon Dr. Michael Galgano discovered that Eron had developed a severe chronic spinal infection from leakage of her oral bacteria into the space around the spinal column in her neck. The infection caused erosion and collapse of four vertebrae in her neck, leading to a rigid "chin-on-chest" posture. Her spinal cord was also significantly stretched out from the hunch-neck deformity that had developed.

Kelly traveled with her mom to Chapel Hill for Eron's consultation with Dr. Galgano. "He was so nice," recalled Kelly. "We walked in and he immediately said 'so nice to meet you, I have a plan.' I was thrilled."

Kelly felt even more sure of Dr. Galgano's surgical expertise and ability to take care of her mom after he took time to speak with Matt about the surgery over the phone. "I had shown the x-rays to some of my partners and they said they wouldn't touch that with a 10-foot pole," recalled Matt. "We were lucky to find Dr. Galgano because he had obviously done this before and had confidence and expertise that he could take care of her. Doctors told her she had to live with this. Galgano said no we got this."

Dr. Galgano understood that correction of Eron's spinal deformity would necessitate a high-risk, multi-disciplinary approach with a complex head and neck ENT specialist. He encouraged Kelly and her family to have their mother evaluated by Dr. Jeffrey Blumberg from the Department of Otolaryngology at UNC Health.

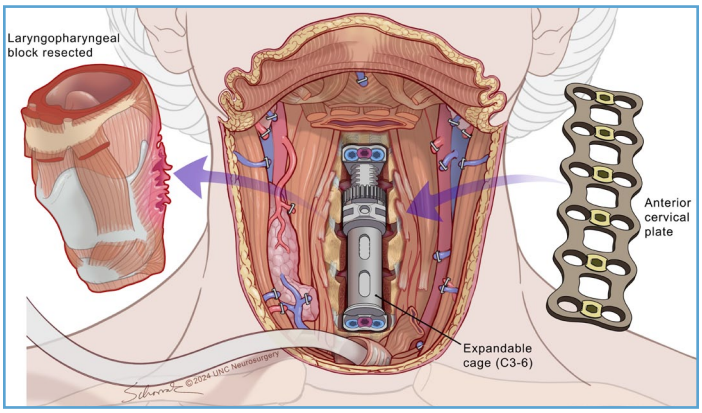
After meeting Dr. Blumberg, "My sister called me crying," recalled Kelly. "They said they could do a flap using a skin graft from mom's arm," said Kelly. "He was so kind and made my sister feel like my mom was worth saving."

Eron went in for stage I of her surgery at UNC Health on January 31, 2024. The surgery was performed by Dr. Galgano and Dr. Blumberg, and lasted for 14 hours.

Due to the lack of functionality of her larynx which was causing her to suffer chronic aspiration, she was offered a laryngectomy to hopefully allow her to eat again. The laryngectomy procedure would also allow for unparalleled exposure to the spine to allow Dr. Galgano to do his work. "The laryngectomy went as planned, but the site of her previous free flap clearly had a fistula to the spine and required removal of all the tissue of the pharynx from the base of tongue to the esophagus," said Dr. Blumberg.

After Dr. Blumberg completed the laryngectomy, Dr. Galgano performed a 4-level vertebral column resection. This entailed the completed removal of Eron's C3, C4, C5, and C6 vertebral bodies. He then reconstructed her spinal column using a titanium vertebral body replacement, and attached it to the remainder of her spine using screws and plates. This part of the surgery removed all of Eron's chronically infected vertebrae, corrected her hunch-neck deformity, and also decompressed her spinal cord.

"Once Dr. Galgano finished his procedure, it was quite late in the day," said Dr. Blumberg. "In order to expedite her reconstruction, a myocutaneous pectoralis major pedicle flap was used to reconstruct her pharynx with a circumferential skin tube."



After allowing her to rest and recover for the next 48 hours from her complex operation, Dr. Galgano took Eron for her stage II operation. This entailed placing screws and rods into the back of her neck for definitive stabilization and maintenance of her new spinal alignment.

Along the course of her recovery, Eron had a skin graft that did not take, and required another small operation. Her wounds were also slow to heal. "This lady has nine lives," said Matt.

In total, Eron spent a month recovering in the hospital followed by a second month at an inpatient rehabilitation facility before being discharged to live with her daughter in North Carolina. Kelly traveled back and forth from Florida and the two sisters made sure their mom made it to all of her appointments.

"She has a bionic neck now," said Kelly. "When we saw Dr. Galgano at follow-up, he shared the pictures of the screws and the surgery."

Now Eron is back in Florida living with her daughter Kelly. Eron is unable to speak, but despite that, Kelly says that her mom's quality of life has improved exponentially. "She's had amazing results," said Kelly. "They released the pressure on her spine and she no longer stumbles and falls. She's learning how to swallow food again. That's something she had not been able to do in 22 years. Overall, she is doing amazing."

Eron can go places with her family and writes to communicate. "I'm still healing, but better every day," said Eron.

> **"My favorite thing about healthcare is you are not just saving one person, you're touching the lives of everyone that loves that person."**

Matt was also extremely impressed with the care that Kelly's mom received. "From start to finish it was outstanding care," said Matt. "The expertise of the doctors and the way they worked together as a team was incredible. Their expertise and skill helped her have minimal problems and an outstanding outcome. Those two really did a great job."

Kelly was also impressed by Dr. Galgano, Dr. Blumberg, and the rest of Eron's care team at UNC Health for never giving up on her mom. "They did so much for her," added Kelly. "It was one problem after another, but they did not quit on her. Now she is as close to whole as she could possibly be after everything she is been through." Kelly and her sister were able to take their mom to France to celebrate her 75th birthday.

Kelly looks forward to being able to spend more time with her mom in Florida and letting Eron enjoy her new favorite food, pudding. "My favorite thing about healthcare is you are not just saving one person, you're touching the lives of everyone that loves that person."

MINIMALLY INVASIVE AND MOTION PRESERVATION PROGRAM

The Minimally Invasive and Motion Preservation Program at UNC Health, led by spinal neurosurgeon Dr. Cheerag Upadhyaya, is dedicated to delivering advanced care for a wide range of spinal pathologies. The minimally invasive component of the program utilizes state-of-the-art techniques to treat degenerative, traumatic, neoplastic, and deformity-related conditions with smaller incisions, reduced recovery times, and less disruption to surrounding tissues. These approaches prioritize achieving optimal outcomes while minimizing the physical and emotional impact of surgery.

The program also emphasizes motion preservation techniques, including cervical arthroplasty and other innovative procedures, to address spinal pathology while maintaining the patient's natural range of motion. These techniques are designed for patients who require surgical intervention but may benefit from preserving spinal function and mobility, thereby enhancing long-term quality of life.

A cornerstone of the program is its multidisciplinary approach to patient care. Each individual undergoes a thorough evaluation by a team of specialists across various disciplines, ensuring the most comprehensive and appropriate treatment plan. Conservative management strategies are always prioritized, with surgery considered only when it is the most effective option for achieving a patient's goals.

Spinal Stenosis Patient Finds Renewed Independence After Laminoplasty Surgery

December 10, 2024

> **"Every patient deserves a treatment plan tailored to their unique needs," said Dr. Cheerag Upadhyaya. "Given Chrissie's circumstances, we wanted to preserve her mobility and independence while relieving the pressure on her spinal cord. Laminoplasty offered the motion-sparing approach she needed to regain her quality of life."**

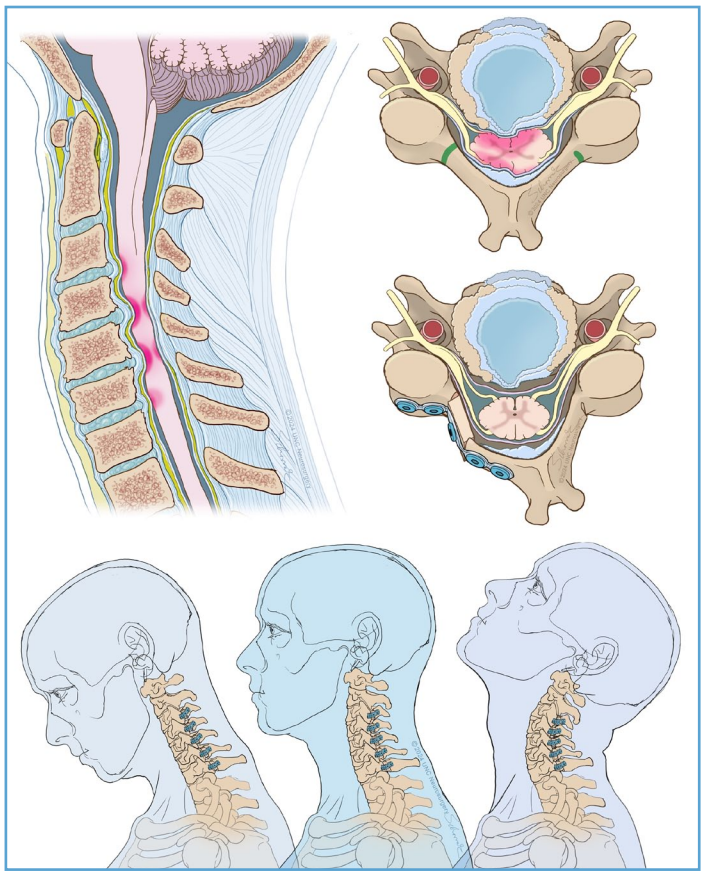
When Chrissie was just three months old, she contracted viral encephalitis, a rare but serious condition that caused her brain to swell, leading to extensive cranial and facial nerve damage. This profoundly affected her ability to move her eyes, swallow, and even gag.

Chrissie spent six weeks in the hospital before transferring to a children's rehab center in New Jersey, where she stayed for nearly a year and a half. "She didn't come home until she was almost two," recalled her mother, Mary Ann.

Even after returning home, Chrissie faced a grueling schedule of daily hospital visits to address her neurological deficits. The viral encephalitis left her with hearing loss and permanent facial nerve damage. While she could see with her left eye, her right eye remained closed, requiring special glasses with a wire mechanism to hold her eyelid open. Doctors predicted Chrissie would never walk, but at 4 ½ years old, she defied expectations and took her first steps.

Chrissie's resilience didn't stop there. Over time, she regained her ability to swallow and speak. She attended school, graduated high school, and earned a degree in English from the College of St. Elizabeth in New Jersey.

In 2020, Chrissie and her family moved to North Carolina. Shortly after, she began experiencing new health challenges. She developed issues with her stomach and throat, felt increasingly unsteady on her feet, and eventually lost the ability to walk in a straight line. While Chrissie had always needed physical and occupational therapy, she had remained mobile until then. By 2024, she relied on a walker and had developed neuropathy in her hands.



In June 2024, Chrissie was referred to spinal neurosurgeon Dr. Cheerag Upadhyaya. After thorough evaluations, she was diagnosed with cervical spinal stenosis, a condition in which the spinal canal narrows, compressing the spinal cord and nerves. This explained her loss of mobility, hand weakness, and ongoing pain.

Given Chrissie's history and needs, Dr. Upadhyaya recommended a laminoplasty, a motion-sparing surgery designed to relieve spinal cord pressure without limiting neck mobility. Chrissie and her parents were immediately drawn to Dr. Upadhyaya's warmth and compassion.

"We loved him right away," Mary Ann said. "He wanted to protect Chrissie's movement and independence, which meant the world to us."

On August 7, 2024, Chrissie underwent a 3 ½-hour laminoplasty at UNC Hillsborough. The procedure involved placing small hinges in her spine to relieve pressure on her spinal cord. Mary Ann praised both Dr. Upadhyaya and the hospital staff. "We've been to some of the best hospitals in New York and New Jersey, but this experience was exceptional," she said.

Chrissie spent a week in recovery before transitioning to the rehabilitation floor, where she worked intensively with therapists.

> **"The therapists made me feel like I could do anything," Chrissie said. "They were so kind and encouraging."**

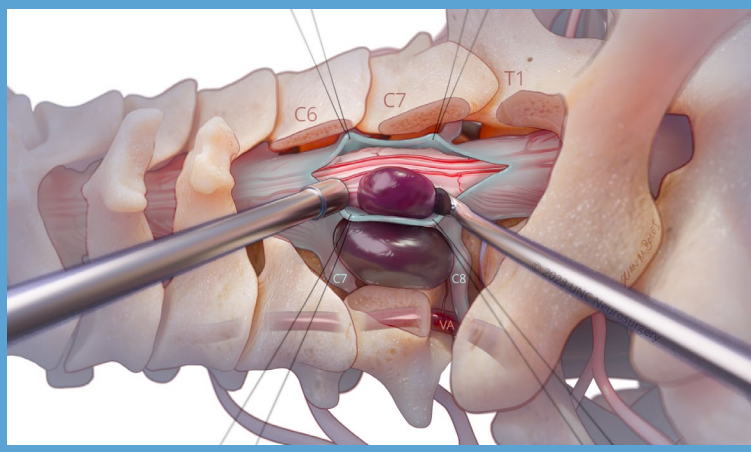
The results were almost immediate. Chrissie noticed significant improvement in her hands and no longer requires daily pain medication. At her follow-up appointment on Halloween, Dr. Upadhyaya watched with pride as Chrissie walked down the hallway.

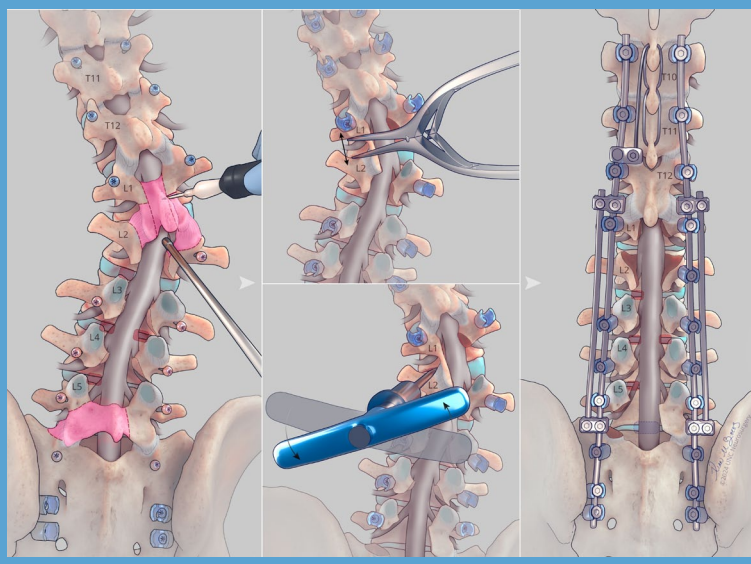
Now back home, Chrissie is regaining her independence. She can dress and bathe herself and uses a walker to move around the house. For the first time in years, she can go for walks without relying on her mother to steady her. "The benefits outweigh the setbacks," Chrissie said, reflecting on her journey.

Full recovery from laminoplasty can take up to two years, but Chrissie is already determined to keep moving forward. Her daily walks symbolize her regained freedom and resilience, a testament to her courage and the power of motion-sparing surgery.

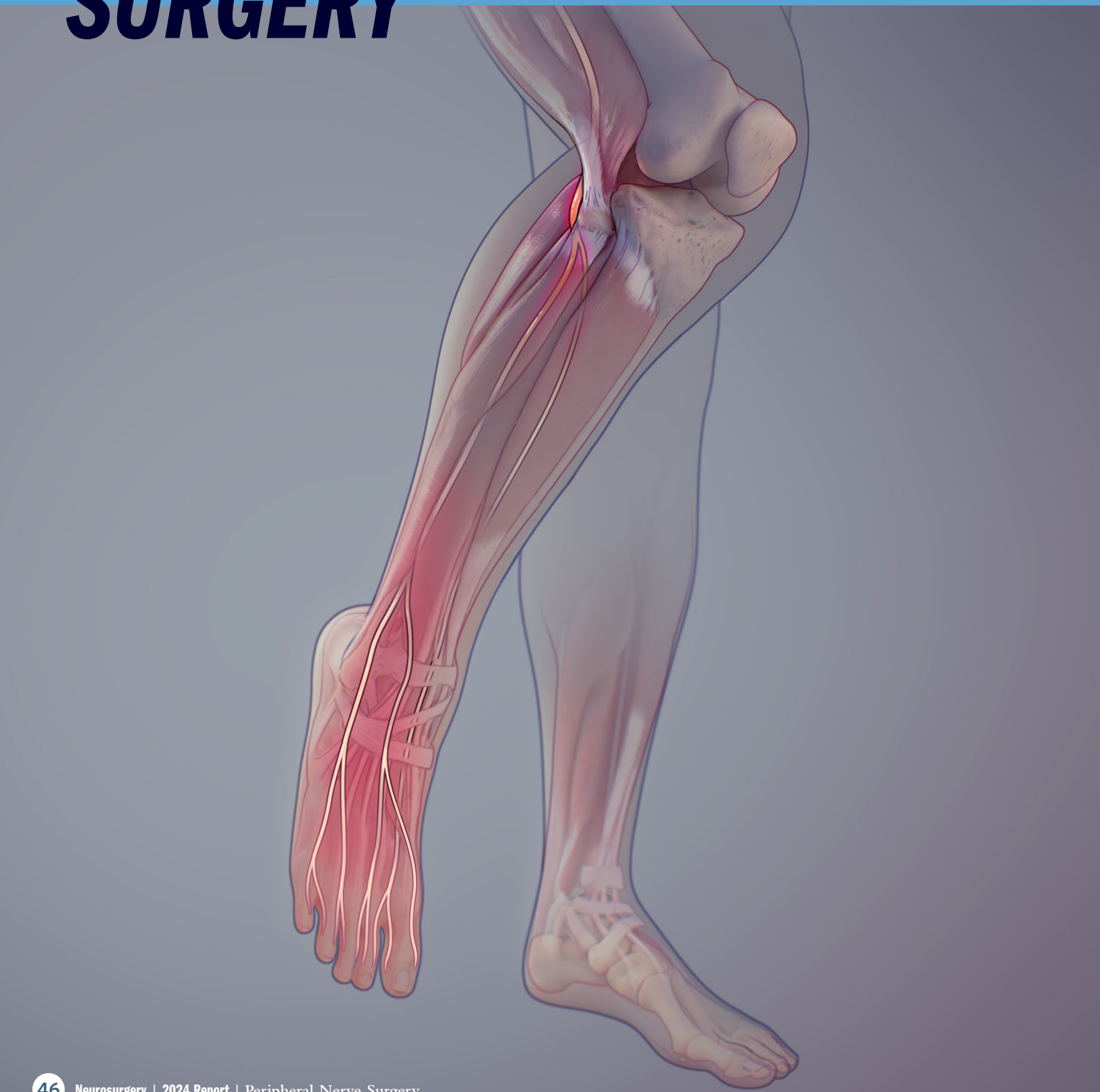
SPINE TUMOR & DEFORMITY PROGRAM

The Spine tumor and deformity program is led by Dr. Michael Galgano. He treats a variety of complex spinal disorders, ranging from adolescent and adult deformity (scoliosis and revision surgery), to both spinal cord and vertebral column tumors (primary and metastatic). Dr. Galgano frequently collaborates with an expert group of multidisciplinary physicians to optimize treatment plans for spinal tumor patients.





PERIPHERAL NERVE SURGERY



Patient Able to Flex her Bicep Again after Successful Nerve Transfer Surgery

January 7, 2025

Shana has Ehlers-Danlos Syndrome, a connective tissue disorder that can cause chronic nerve and spine related pain. When Shana awoke from a surgery to treat thoracic outlet syndrome, she immediately noticed numbness in her left forearm and pain that hurt worse than her incisions.

When Shana went home, she was in intense pain, was unable to sleep, and she had a large bruise on her left bicep. She was gripping her arm through the pain. When she finally released her arm, she noticed that her left forearm looked different from her right. Her husband also noticed the change.

Shana's forearm looked contracted and her bicep was bruised and "flopped over" despite the fact that she had always had defined muscles in her arms from years of working out at the gym. Shana scheduled an appointment with pain specialist Dr. Andrew Lobonc at UNC Health. "When I showed him my bicep and my left arm, Dr. Lobonc got very concerned," recalled Shana.

Shana's arm was numb, she still had bruising, and she could not get her bicep to engage. Dr. Lobonc was concerned about the inactivity of Shana's musculocutaneous nerve because it was not moving and not responding. Dr. Lobonc completed trigger injections to help relieve Shana's pain.

Shana started physical therapy to try and help her bicep. During her first visit, her physical therapist tried testing nerve responses around Shana's bicep. "She couldn't find any nerve response at all," recalled Shana.

She started going to the gym and exercising again without weights. When she started to use her arms, her left forearm would compensate for her bicep. After a few months post-surgery, a nerve test confirmed severe nerve damage. During her next appointment with Dr. Lobonc, Shana was told about peripheral nerve surgeon, Dr. Mark Attiah. "Dr. Lobonc told me that UNC had just got a new neurosurgeon and asked if I would like to be referred to him," said Shana.

At this point, Shana had met with various doctors, dealt with intense pain, and had tried physical therapy and different pain management treatments. She had been given false hope over and over again, and was even told to give up on her nerve.

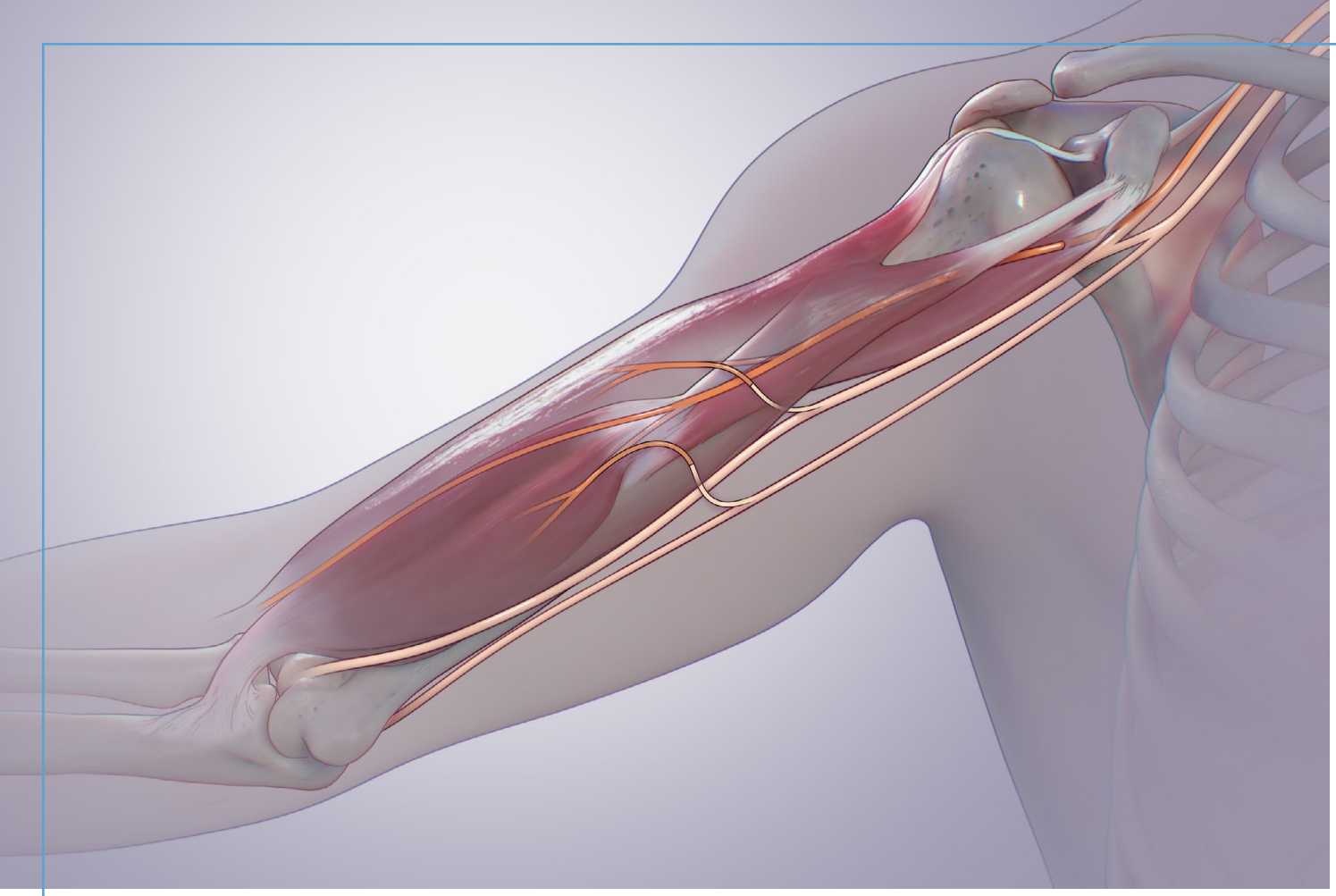
When Shana saw Dr. Attiah, she knew she had found someone that could help her. "He answered all of my questions and was extremely knowledgeable," said Shana.

Dr. Attiah recommended further testing to assess the damage. Shana had a neuroma, indicating that the nerve was damaged. Dr. Attiah then explained Shana's surgical options, including the benefits and risks associated with her options.

> **"He brought out pictures and answered all of my questions to help us understand," said Shana. "He took as much time as needed for me to completely understand and make a decision."**

Shana went in for surgery. Dr. Attiah planned to go in and map the region and assess the damage, then repair any damaged parts. But during surgery, Dr. Attiah discovered that Shana's nerve was completely severed, and there was nothing to reconstruct.

After surgery, Dr. Attiah explained that he had to abandon his original surgical plan. Shana required a nerve transfer surgery. "The surgery involves taking portions of healthy nerves and rerouting them to nerves that have damage," said Dr. Attiah. "Nerve injuries are time sensitive and should be treated as soon as possible. After a year, the nerve will likely not heal."



Dr. Attiah would perform a procedure that would take two healthy "donor" nerves controlling her wrist and hand and connect them to both the nerve in the bicep and the brachialis muscle. Dr. Attiah explained to Shana that this would put otherwise healthy nerves at risk for temporary or permanent damage.

Shana decided to proceed with the surgery. "Any time I would talk to him, I would have his undivided attention," said Shana. "He would explain everything to me and allowed me to record things."

The surgery was extensive. "The part that takes the longest is testing the wires in the nerve," explained Dr. Attiah. "We use a fine electrical stimulator and touch each wire, causing her hand and wrist to flex and contract during surgery, to make sure that we aren't cutting something that will damage function permanently."

Shana stayed in the hospital overnight before being discharged the following day. After discharge, her long road to recovery began.

Patients with severe nerve injuries can take up to two years to heal after surgery, and the success of the surgery is dependent on each patient's consistency with physical therapy.

> **"Shana is very motivated to get better," said Dr. Attiah. "She attends her many therapy appointments and does her exercises."**

Shana wore a sling for seven and a half weeks post-surgery, then worked with physical therapy and a hand therapist to help retrain the nerve. Shana, who is no stranger to surgeries and injuries, described the excruciating recovery process. "I had so much pain in my hand," said Shana. "The nerve pain was insane. But Dr. Attiah really worked with me and sent me to the appropriate doctors that could help manage my pain."

Shana needed help with basic day-to-day functions such as dressing, bathing, and cutting her food. Shana also developed complex regional pain syndrome, a disorder that can occur after a nerve injury that can lead to swelling and changes in temperature sensation. Part of Shana's recovery included seeing pain management specialists for nerve blocks to help manage her pain. She also developed frozen shoulder.

Shana's nerve test at three months was discouraging because she did not have any response in her bicep. Despite the news, Shana continued with her physical therapy appointments and exercise routine.

On July 3, 2024, Shana was told that she could try to lift her arm. "It was not easy, but I was starting to be able to move," said Shana. "I was finally able to lift my arm."

On August 26, 2024, Shana hit another milestone when she was able to do her own hair without having to rely on her husband or friends.

Finally, at Shana's six-month nerve test, there was a response detected in her biceps. Shortly after, she started developing muscle twitches. The surgery had been a success.

Now, Shana can do a bicep curl at the gym. She has movement in all of her fingers, except for her thumb. She can lift and throw a medicine ball. She attributes a lot of her mobility and success to exercise. "I was going to four to eight doctors a week," recalled Shana. "I have a long way to go. I'm not lifting much on my left side, but I have something to work with now."

Her friends at the gym have watched Shana's journey and saw her tears when she tried to do certain moves with a bicep that would not work. "Throughout this whole process people at the gym would ask me how I am doing," said Shana. "I would say 'I am here.' But for the first time, people are asking me how I'm doing and I'm saying 'I'm good and I'm getting better.'"

Shana's fingers are getting stronger, and she has much more mobility and range of motion. Shana goes to physical therapy and occupational therapy and continues to work out regularly. She looks forward to returning to her hobbies and work at her swim school as she continues to heal.

> **"I've never seen any doctor do the things that Dr. Attiah has done for me," said Shana.**

PERIPHERAL NERVE SURGERY PROGRAM

UNC Health is one of a few centers in the country that offers complex peripheral nerve surgery, and Dr. Mark Attiah is one of only a handful of neurosurgeons who treats peripheral nerve entrapments, peripheral nerve and brachial plexus injuries, and peripheral nerve tumors. He offers surgical procedures including decompressions, nerve harvesting and grafting, and nerve transfers, using adjuncts such as endoscopy and intraoperative stimulation and recording.

Dr. Attiah is an integral member of the UNC Peripheral Nerve Center, a multidisciplinary team of practitioners aiming to treat every aspect of patients with peripheral nerve disorders. The Peripheral Nerve Center treats patients with nerve-related pain and numbness and works to restore function to limbs with weakness and paralysis.

Dr. Attiah is also a member of the multidisciplinary Neurofibromatosis (NF1) Program at UNC Health as the peripheral nerve surgeon, treating nerve tumors including schwannomas, simple and plexiform neurofibromas and malignant peripheral nerve sheath tumors.

EDUCATION

IN THE LAB

The Miracles in Sight Surgical Skills Laboratory is a state-of-the-art facility with a 42-person didactic room, with 16 resident stations that each contain an operating microscope, monitor, cranial instruments, and drill. The lab also houses a C-ARM and two surgical beds for spine dissection labs.

Residents attend a monthly skills lab with each postgraduate year sharing their own specimen. Our Residency Program Director, Dr. Carlos David begins each year with the basics, including suturing and EVD placement, then progresses into cadaver dissection with surgical approaches including pterional, orbitozygomatic, retrosigmoid, middle fossa, and suboccipital craniotomies. Each lab starts off with a didactic before putting those skills to work in the lab.

Message from the Vice Chair for Education, Dr. Carlos David

It is with great enthusiasm that I share updates on the significant strides we have made in the educational mission of the UNC School of Medicine's Neurosurgery Department. Over the past year, we have undertaken a comprehensive overhaul of our residency training program, focusing on enhancing both the structure and content of our educational offerings.

First, we have restructured the block rotation schedule to ensure residents receive a more balanced and immersive clinical experience. From day one, residents are exposed to increased operative experience, allowing for earlier skill acquisition and hands-on involvement in neurosurgical procedures. This shift is designed to foster both technical proficiency and confidence in our trainees, ensuring they are well-prepared for independent practice.

In addition to the changes in clinical exposure, we have implemented a formalized didactic lecture series and curriculum. These sessions are crafted to ensure systematic, in-depth learning that complements the clinical and operative experience. To further support a well-rounded educational experience, we have introduced weekly grand rounds featuring the latest innovations in neurosurgery, interactive case discussions, and contributions from leading experts in the field. This initiative provides a platform for knowledge exchange and stimulates collaborative thinking.

Another cornerstone of our educational restructure is the mandatory quality improvement conference. This conference ensures that all residents engage in critical reflection on patient care practices, emphasizing the importance of continuous improvement and patient safety.

We are also excited to announce the establishment of a monthly cadaveric laboratory dissection course. This hands-on learning opportunity allows residents to refine their anatomical understanding and surgical skills in a controlled environment, bridging the gap between theoretical knowledge and practical application.

Recognizing the importance of research in advancing neurosurgical practice, we have reinforced our support for resident research activities. Residents are now provided with dedicated coaching, periodic reviews of their progress, and opportunities to present their work at national meetings. This aspect of our program underscores our commitment to producing clinician-scientists who are not only skilled surgeons but also pioneers in neurosurgical innovation.

These initiatives are aimed at cultivating a world-class neurosurgical training program that produces leaders in both clinical practice and academic neurosurgery. I am proud of the efforts of our faculty and residents in embracing these changes, and I look forward to seeing the continued growth and success of our department.

Current Neurosurgery Residents

CHIEF RESIDENTS

Andrew Abumoussa, MD, MSc

Dr. Abumoussa studied high performance computing and artificial intelligence in graduate school. He returned home to North Carolina for medical school and neurosurgery residency. His interests include complex spine and neuroprosthetics. Last year, Dr. Abumoussa received the KLS Martin Innovations Challenge Award for his work on utilizing consumer grade iOS devices to provide stereotactic neuronavigation for flexible endoscopy.

Kelly Chamberlin, MD, MSCR

Dr. Chamberlin graduated from the Frank H. Netter School of Medicine and is interested in pediatric neurosurgery. Her research interests include pediatric tethered cord syndrome, minimally invasive surgery, and pediatric brain tumors. After graduation, Dr. Chamberlin will complete a pediatric neurosurgery fellowship at Le Bonheur Children's Hospital / St. Jude Children's Research Hospital.

PGY 6

Samuel Reed, MD

Dr. Reed attended the University of North Carolina for both his undergraduate and medical school education. He is interested in vascular surgery and skull base surgery. He hopes to complete an endovascular fellowship after his residency graduation.

Aaron Gelinne, MD

Dr. Gelinne spent five years in the US Navy as a Nuclear Engineering Officer before earning his MD from the Larner College of Medicine at the University of Vermont, and is interested in integrating his engineering background to come up with innovative solutions to neurosurgical problems. He is also interested in spine and vascular neurosurgery.

PGY 5

Nicole Silva, MD

Dr. Silva's research and clinical interest is in functional and epilepsy neurosurgery. She received grant funding to fund her research evaluating gender differences in treatment delays in focused ultrasound ablation for essential tremor. She is passionate about reducing health disparities within neurosurgery. She is also studying optimizing targeting and outcomes of focused ultrasound for treatment of essential tremor.

Bethany Andrews, MD

Dr. Andrews attended medical school at the University of Oklahoma. Her current research focus is on outcomes regarding open prenatal repair of myelomeningocele and hydrocephalus management, and is currently involved in global health research. Last year, Dr. Andrews traveled to Mauritania to visit the first neurosurgical center in the region.

PGY 4

Boyi Li, MD

Dr. Li's time at New York Medical College grew her passion for neurosurgery and in research focused on prognostication and management of aneurysmal subarachnoid hemorrhages. Her current interests include pediatric and vascular neurosurgery, medical student education, and social and healthcare advocacy.

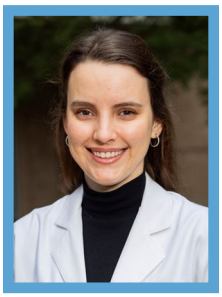
Jackie MacDonell, MD

Dr. MacDonell completed a Master's degree in Biomedical Sciences from Barry University before attending Albany Medical College. She is interested in pursuing a career in pediatric neurosurgery.

PGY 3

Allie Harbert, MD, MPH

Dr. Harbert attended medical school at the University of North Carolina School of Medicine. Her research focus is on appropriate utilization of medical resources and disparities in access to care and outcomes based on socioeconomic and demographic characteristics.



Olivia Gilbert, MD

Dr. Gilbert attended LSU School of Medicine, where she founded the school's chapter of the AANS. Her academic interests include pediatric, trauma, and global neurosurgery, as well as fetal repair of spina bifida. Last year, Dr. Gilbert traveled to Mauritania to visit the first neurosurgical center in the region.

PGY 2

Mitchell Rock, MD

Dr. Rock attended Georgetown University School of Medicine, and completed the Health Justice Scholars Track to learn more about health policy and advocacy. His academic interests include functional neurosurgery and neuro-oncology, along with healthcare disparities and advocacy.

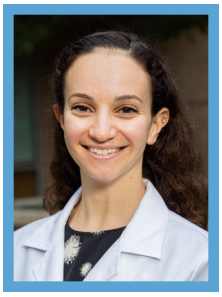
Sierra Smalley, MD

Dr. Smalley studied medicine at Michigan State University. Her academic interests include pediatric and functional neurosurgery, specifically the treatment of epilepsy.

PGY 1

Deveney Franklin, MD

Dr. Franklin attended the University of North Carolina for both medical school and her undergraduate degree. During her time in medical school, she developed a mentorship program called "Neuro Mentoring Matters" focused on increasing access to neurosurgery for minority pre-med and med students. Her research interest is in neurosurgical oncology of the brain and spine.



Zoe Robinow, MD

Dr. Robinow studied at California Northstate University College of Medicine. She then completed a surgical internship at the University of California San Francisco – East Bay where she was awarded Intern of the Year. Her academic interests include neurotrauma and healthcare disparities.

Recent Graduates

2022

Dr. Brice Kessler

Fellowship: Stereotactic and Functional Neurosurgery – West Virginia University
Current position: Academic practice, St. Luke's Neurosurgical Associates, Bethlehem, PA

Dr. Michael Catalino

Fellowship: Neurosurgical oncology, MD Andersson Cancer Center
Current position: Academic practice, University of Virginia, Department of Neurosurgery

2023

Dr. Martin Piazza

Fellowship: Pediatric Neurosurgery, UPMC Children's Hospital in Pittsburgh
Current position: Academic practice, University of Pittsburgh, Department of Neurosurgical Surgery

Dr. Randaline Barnett

Fellowship: Pediatric Neurosurgery, University of Tennessee Health Science Center in Memphis
Current position: Academic practice, Kentucky Children's Hospital at the University of Kentucky

2024

Dr. Nathan Quig

Fellowship: Endovascular Fellowship at Temple University Hospital in Philadelphia, PA

Dr. Darshan Shastri

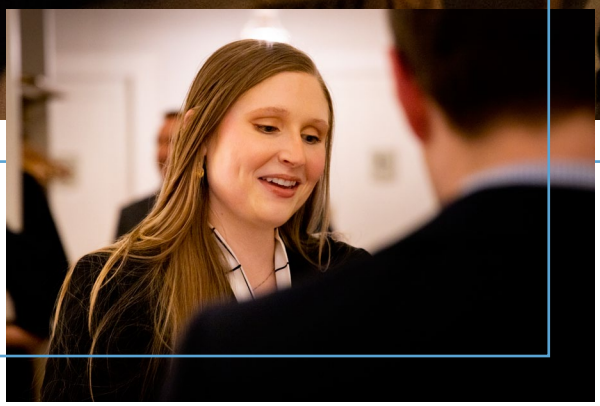
Fellowship: Neuroendovascular Fellowship at Washington University in St. Louis

Resident Achievements

- **Dr. Andrew Abumoussa** awarded the KLS Martin Innovations Challenge Award
- **Dr. Martin Piazza** awarded the Residency Traveling Fellowship in Pediatric Neurosurgery by the Joint Pediatric Section of the AANS/CNS
- **Dr. Andrew Abumoussa** awarded CNS Scholarship in Data Science
- **Dr. Aaron Gelinne** presented his Laine research at the 2023 North Carolina Spine Society Meeting
- **Dr. Andrew Abumoussa** created an AI-Driven iOS app build for neuro-navigation during his 5th year of residency
- **Dr. Nicole Silva** received grant funding to support a focused ultrasound study evaluating gender differences in treatment delays in focused ultrasound ablation for essential tremor
- **Dr. Deveney Franklin** presented a poster on a case of primary mixed intramedullary-extramedullary spinal meningeal melanoma at the 2024 CNS meeting
- **Dr. Martin Piazza** developed a medical student primer education series on YouTube during the pandemic
- **Dr. Michael Catalino** organized the Winter Lecture Series featuring various prestigious physicians across the United States
- **Dr. Kelly Chamberlin** and **Dr. Olivia Gilbert** inducted into the Alpha Omega Alpha National Medical Honor Society
- **Dr. Randaline Barnett** named Kentucky Colonel by state Governor after aid during Kentucky flooding
- **Dr. Kelly Chamberlin** and **Dr. Olivia Gilbert** presented at the 2023 Neurosurgical Society of the Virginias Annual Meeting
- **Dr. Martin Piazza** participated in the 2023 Neurosurgery Publications Resident Social Media Panel
- **Dr. Andrew Abumoussa** awarded the 2022 Innovation Pilot Award

Visiting Professors

- **Dr. Daniel Yoshor**, Penn Medicine
- **Dr. Mark Hadley**, University of Alabama at Birmingham
- **Dr. Martha Morrell**, Stanford Medicine
- **Dr. Fred Meyer**, Mayo Clinic
- **Dr. Paul McCormick**, Columbia University
- **Dr. Richard Ellenbogen**, University of Washington
- **Dr. Robert Rosenwasser**, Thomas Jefferson University
- **Dr. Timothy Gershon**, Emory School of Medicine



RESEARCH

Message from the Vice Chair for Research, Dr. Soma Sengupta

UNC is the 9th top-ranked university in the US for federal research and is a fantastic place for clinician scientists and researchers. Recently, I was awarded the Mayfield Scholar Award, which protects 60% of my time for research. The research of UNC's neuroscience programs explores ways to cure diseases but also looks to improve a patient's quality of life through minimally invasive techniques and exploring alternatives to invasive surgical procedures. Our faculty members engage in collaborative research in labs across the university's campus.

With the recent philanthropic donation of the low-intensity focused ultrasound machine, Dr. Vibhor Krishna's team from functional neurosurgery is now able to participate in a multicenter clinical trial evaluating the possibility of opening the blood-brain barrier to obtaining a tumor's biomarkers, mitigating the need for an invasive needle biopsy. My neuro-oncology colleague, Dr. Yasmeen Rauf, has recently been awarded a co-PI R21 with Dr. Paul Dayton and is included on an R01 with the focused ultrasound group at UNC. Dr Rauf is part of the cellular therapies group for the CAR-T cell trial in recurrent GBM. In the functional neurosurgery space, Dr. Vibhor Krishna is R01 funded, and he uses minimally invasive, low-risk ablation to treat patients with movement disorders such as essential tremor, Parkinson's Disease, and epilepsy, which is a game changer for these patients.

Since 2021, we have seen a surge in publications from the neurosurgical department, including Dr. Vibhor Krishna's publication in the New England Journal of Medicine summarizing the results of a multicenter clinical trial that showed bilateral focused ultrasound to be a safe and effective treatment for patients with Parkinson's disease. Dr. Dominique Higgins also co-authored an important publication in Nature Communications on his ferroptosis research for gliomas, showing that ferroptosis is a promising avenue for cancer treatment. Dr. Daniel Pomeranz Krummel and I published in Cancers on the GABA(A) receptor activation as a new way to target lung cancer that has metastasized to the brain that does not impact quality of life but also enhances survival. I was also a co-first author in a Phase 3 clinical trial published in Cell Reports Medicine, which showed that cancer stem cell assay-guided chemotherapy improves the survival of patients with recurrent glioblastoma. Dr. Michael Galgano and Dr. Carlos David have published many operative videos in various online publications demonstrating their surgical expertise in spine and endovascular surgery.

As the vice-chair of research, I am committed to supporting neurosurgical residents in their research projects, securing more funding, and increasing the visibility of our research enterprise. Our goal is to continue performing cutting-edge clinical research and trials that benefit patients, not only in North Carolina but also beyond. We are dedicated to improving standard-of-care treatments and discovering novel ones, ensuring that our patients receive the best possible care.

Clinical Trials at UNC Health

BRAIN TUMOR

CAR-T Clinical Trial

Dr. Yasmeen Rauf is leading the CAR-T clinical trial evaluating the safety and tolerability of CAR-T immunotherapy, a very promising therapy for patients with recurrent or progressive glioblastoma. The CAR-T used in the clinical trial is manufactured in our labs on campus.

SONOBIRD Clinical Trial

UNC Health became the first center in the United States to begin enrolling patients in the SONOBIRD phase III clinical trial using a device called SonoCloud®. The goal of the device is to more effectively delivery chemotherapy through the brain to treat malignant brain tumors and is open to glioblastoma patients with their first recurrence. The clinical trial is led by Dr. Dominique Higgins.

TRIDENT Clinical Trial

Dr. Colette from the UNC Lineberger Comprehensive Cancer Center currently leads the TRIDENT clinical trial. The study evaluates the safety and efficacy of tumor treating fields (TTFields) concurrent with standard of care therapies.

Imvax Phase 2b Clinical Trial of IGV-001

The study, led by Dr. Soma Sengupta, was designed for patients newly diagnosed with glioblastoma. UNC Health was the only site for this trial in North Carolina and the southeast region.

BT015/LIBERATE Clinical Study

Thanks to the generous donation of the low intensity focused ultrasound machine, we are able to enroll glioblastoma patients in the study using focused ultrasound to temporarily disrupt the blood-brain barrier, facilitating liquid biopsies.

ROADS Clinical Study

This clinical study, led by Dr. Dominique Higgins, compares 2 FDA-cleared radiation treatments that are proven safe and effective: GammaTile® Surgically Targeted Radiation Therapy and Stereotactic radiotherapy.

Phase II Clinical Trial of Ropidoxuridine

The Phase II clinical trial of Ropidoxuridine, a radiation sensitizer developed by Shuttle Pharma, is enrolling patients with newly diagnosed with glioblastoma. The drug aims to enhance the positive effects of radiation therapy for patients with unmethylated MGMT glioblastoma. The study is led by Dr. Soma Sengupta and is the only site in this region that has the study open.

Expanded Access to Gallium Maltolate (GaM)

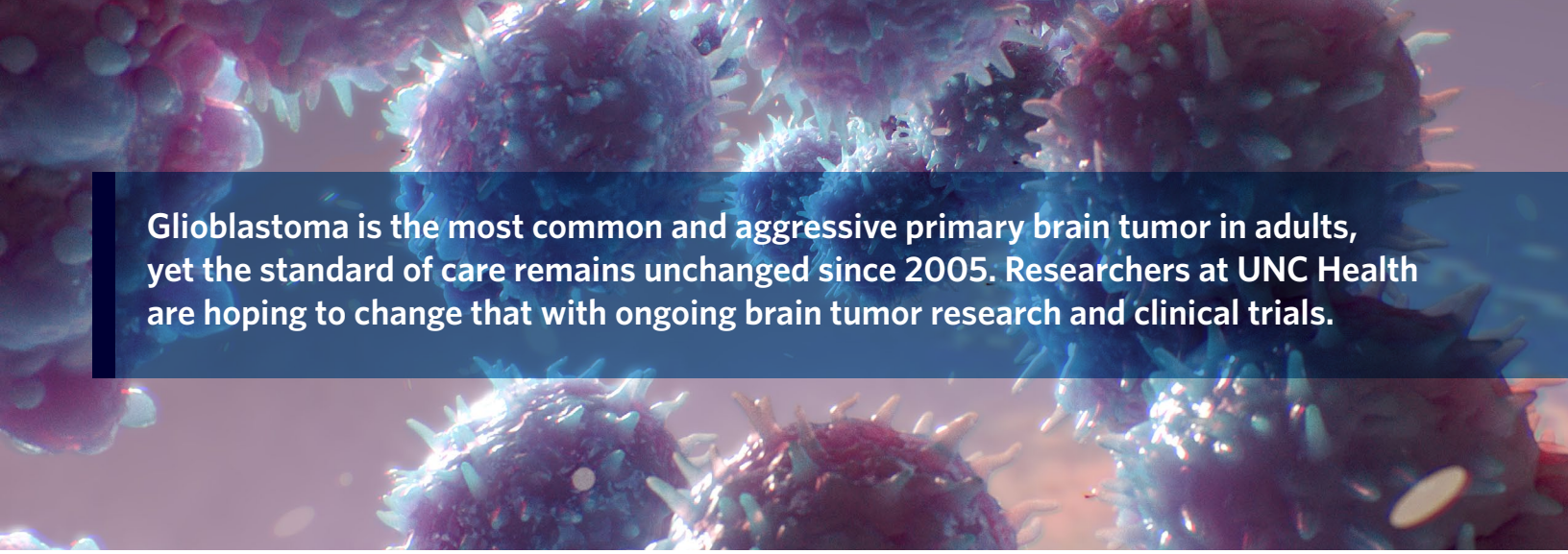
Expanded Access Program for a new cancer therapy for patients with recurrent glioblastoma (GBM) that is now available at three different locations in the United States. The study is for patients with recurrent GBM, and who meet the eligibility criteria and cannot access the phase 1 clinical trial for the investigation of GaM.

Lomustine-Temozolomide Combination Therapy Versus Standard Temozolomide in Patients with Methylated MGMT Promoter Glioblastoma

Patients with methylated MGMT promoter glioblastomas will be randomized into two groups and will receive either a combination of lomustine and temozolomide or temozolomide alone during radiation therapy.

Stereotactic Radiosurgery w/ DDR Inhibitor (Olaparib) Followed by Adjuvant Durvalumab & Chemotherapy

Patients with brain metastases and triple negative breast cancer will be given olaparib (oral chemotherapy) during radiation followed by a combination of immunotherapy (durvalumab) and physician's choice of systemic chemotherapy. This study also offers the option to participate in a surgical sub-study where participants only receive olaparib prior to tumor resection and are not given immunotherapy/chemotherapy.



Glioblastoma is the most common and aggressive primary brain tumor in adults, yet the standard of care remains unchanged since 2005. Researchers at UNC Health are hoping to change that with ongoing brain tumor research and clinical trials.

Genetic Testing in Guiding Treatment for Patients with Brain Metastases

For patients with solid tumors and brain metastases, genetic testing of brain tumor is used to guide a patient's treatment plan. Patients will be assigned to 1 of 4 oral chemotherapy options based on genetic mutation pathway.

Nivolumab plus or minus Ipilimumab in Combination with Multi-fraction Stereotactic Radiosurgery for Recurrent High-grade Radiation-relapsed Meningioma

Patients with relapsed/recurrent Grade 2 to 3 meningioma, who have already received radiation therapy and surgery, will be randomized to one of two immunotherapy treatment groups. One treatment arm will receive a combination of immunotherapies (nivolumab + ipilimumab) and the other treatment arm will receive only one type of immunotherapy (nivolumab alone) during reirradiation.

CEREBROVASCULAR/ENDOVASCULAR

Lumosa 203

This is a randomized, placebo-controlled, double-blinded, phase II clinical trial evaluating the effectiveness of LT 3001 (neuropeptide) to treat patients with acute ischemic stroke.

ENDOCRINOLOGY

SIGNAL

This is a Phase 2 clinical trial of LB54640, a once daily oral medication, in patients with hypothalamic obesity and is now enrolling patients to help determine efficacy and safety of LB54640 in patient with hypothalamic obesity, which can occur in patients diagnosed with craniopharyngiomas and other brain tumors occurring near the hypothalamus. The clinical trial is sponsored by Rhythm Pharmaceuticals.

REAL-7

This is a Phase 4 study of Somapacitan (Sogroya) the only once-weekly growth hormone product currently available for use in the U.S. for treatment of patients with adult growth hormone deficiency (AGHD). AGHD is a common component of the multiple pituitary hormone deficiencies occurring in patients with hypopituitarism.

Sogroya®

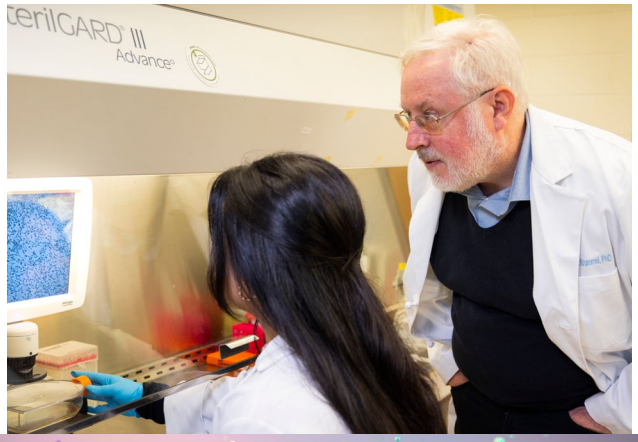
This is a multinational, multi-center, prospective, single-arm, observational, non-interventional post-authorisation safety study to investigate long-term safety of Sogroya® (somapacitan) in adults with growth hormone deficiency (AGHD) under routine clinical practice. The clinical trial is sponsored by Novo Nordisk.

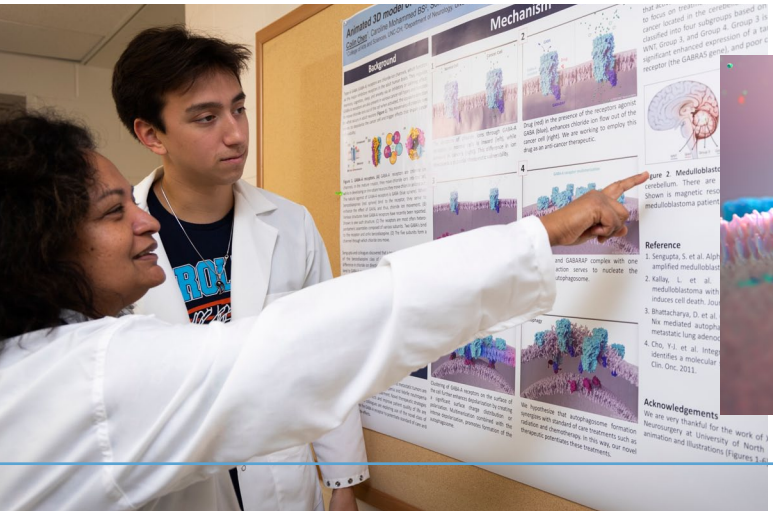
Labs and Current Research

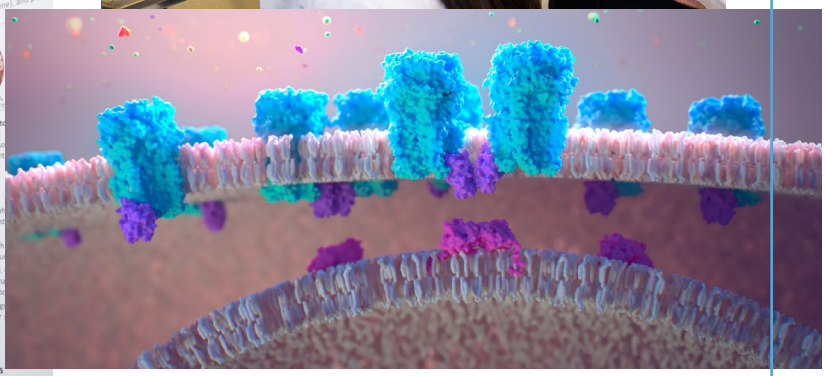
LABS

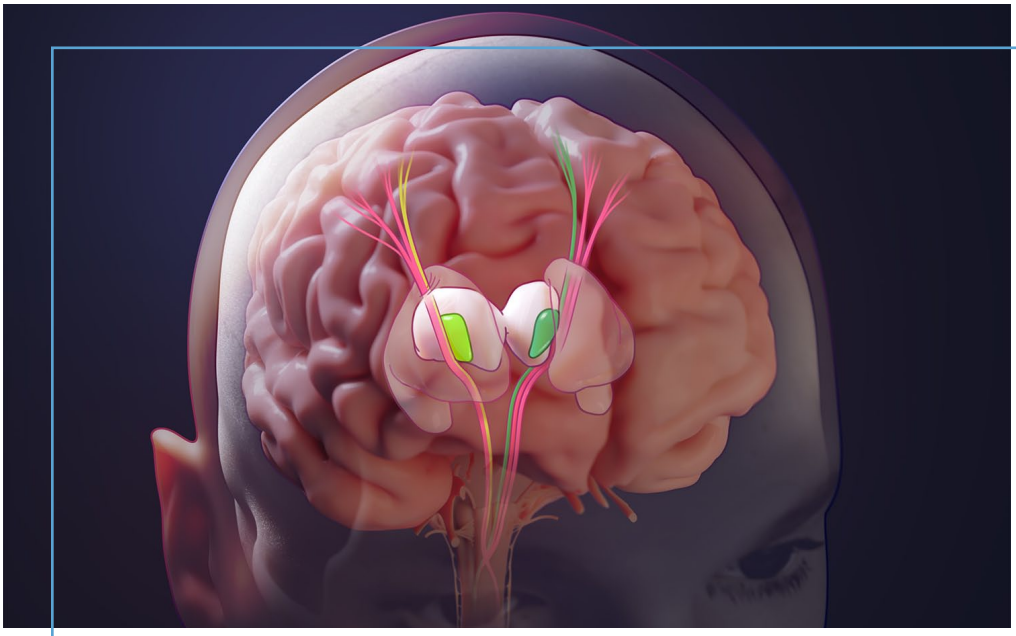
SoDa Lab

Dr. Soma Sengupta and Dr. Pomeranz Krummel's laboratory, the SoDa Lab, is investigating new approaches to treat primary and metastatic brain cancers. A major focus of their laboratory is the study of the role of membrane transport proteins in contributing to a brain tumor microenvironment and how to leverage these proteins as therapeutic targets for treatment. Their laboratory is actively training students. Website: https://www.med.unc.edu/neurosurgery/neuro-oncology-translational-lab/



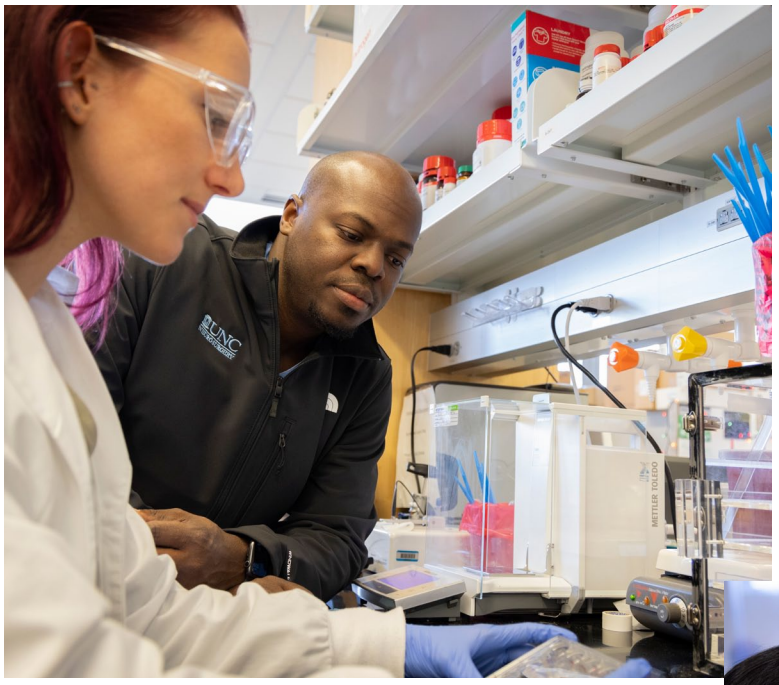


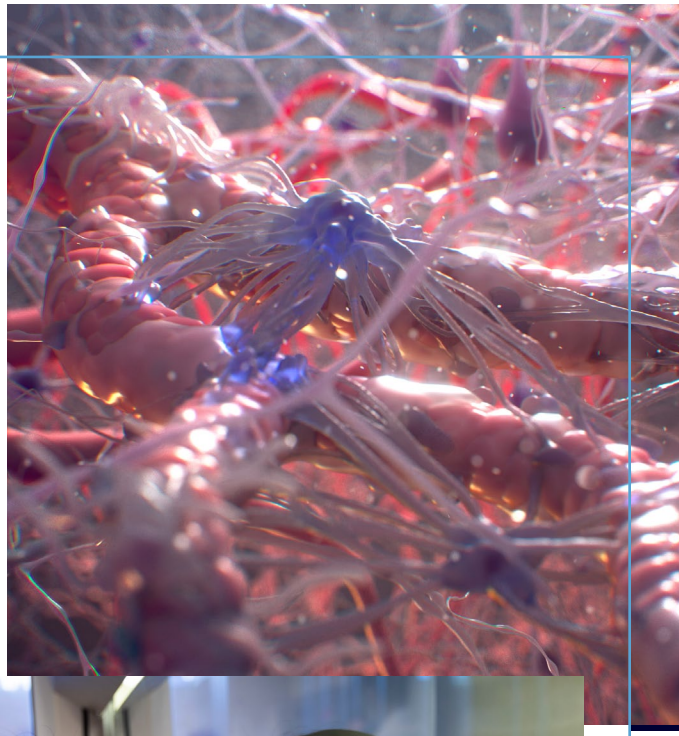




Krishna Lab

In addition to leading UNC's clinical focused ultrasound program, functional neurosurgeon Dr. Vibhor Krishna's laboratory research centers on optimizing less- and non-invasive neurosurgery by pairing advanced functional imaging with neurosurgical or neuromodulatory interventions. The Krishna Lab performs cutting-edge translational research to improve patient care and advance our understanding of brain structure and function. Website: https://www.med.unc.edu/neurosurgery/krishnalab/





Higgins Lab

Dr. Dominique Higgins is the director of the Higgins Lab. His research is focused on improving local delivery of novel therapeutics to brain tumors using focused ultrasound and targeting metabolism to better diagnose and treat malignant and benign brain tumors. The Higgins Lab has developed pre-clinical models of glioblastoma, and is studying dietary strategies that enhance targeted programmed cell death by ferroptosis, molecular imaging strategies to track tumor progression, and local delivery of ferroptosis-inducing therapies.

Research Grants

- **Dr. Vibhor Krishna** awarded R01 NIH grant for FUS Ablation research
- **Dr. Dominique Higgins** received the NRCDP Award to fund his brain tumor research
- **Dr. Soma Sengupta and Dr. Daniel Pomeranz Krummel** received the ABTA Discovery Grant to fund research in the SoDa Lab
- **Dr. Soma Sengupta** was selected as the Mayfield Scholar Award, providing funding for her brain tumor research
- **Dr. Sengupta** received research funding from Ian's Friends Foundation
- **Dr. Yasmeen Rauf and Dr. Paul Dayton** received an NIH R21 grant for focused ultrasound research
- **Dr. Dawn Kernagis** is part of a research group that was given $4.25 million from the U.S. Department of Defense to explore a possible military application of an experimental device that nudges the brain into deep sleep, to restore mental sharpness to sleep-deprived soldiers on the battlefield. Dr. Kernagis collaborated on research exploring the glymphatic system, the "power-washing" system in the brain that activates during deep sleep, flushing away harmful waste. An article on this research was published in The Washington Post in May 2022.

Additional Research

Digital Art Therapy

Dr. Soma Sengupta is working with Dr. Claudia Rebola (University of Cincinnati, Associate Dean of Research at DAAP), and Prof Sam Anand (Director of the Siemens PLC Simulation Technology Center) in developing the digital art therapy tool with generative AI. Later this fall, she is opening a trial using the digital art therapy App trial in AYAs to help with mood and other psychological outcomes. This work was funded by the Ian's Friends Foundation (2022).

Business Administration

Dr. Sengupta presented a NC Brain Tumor Network project at the Executive Leadership of Academic Medicine Symposium 2024, and she is working with Gene Hobbs and Professor Lindsey Haynes-Maslow in further developing the model. The objective is to work with a team of UNC Master of Healthcare Administration students for a semester-long business planning project that will further refine the model and business strategy to grow the brain tumor program at UNC.

Publications from UNC Neurosurgery 2021-2024

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UNC NEUROSURGERY AT THE NEUROCHARITY SOFTBALL TOURNAMENT

UNC Neurosurgery faculty and residents participated in the Columbia University NeuroCharity Softball league in New York City. The tournament, hosted in Central Park, raises money to support promising brain tumor research at neurosurgery programs around the country.

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After the tragic loss of their son to a brain tumor, Van and Kay Weatherspoon are dedicated to supporting brain tumor research. They have established multiple professorships and research funds at UNC Health, making significant contributions to the brain tumor program. The Weatherspoon family supports the annual Weatherspoon Brain Tumor Symposium, which features guest lecturers who are leaders in the field of brain tumor research and treatment.

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