Letter from the Chair
Griffith R. Harsh IV, M.D., M.A., M.B.A.
Professor & Julian R. Youmans Endowed Chair

Though 2020 and COVID-19 brought considerable challenges, I am pleased the department continues to grow and evolve its clinical programs.

We welcomed several new faculty members early in the year, cerebrovascular neurosurgeon Dr. Branden Cord, spine neurosurgeon, Dr. Allan Martin, neurocritical care specialist, Dr. Jeffrey Vitt and neuro-oncologist Dr. Orwa Aboud. Each of these new faculty members has had considerable effect in their respective areas and we are pleased to see their contributions making an impact in teaching and patient care.

The COVID-19 pandemic became reality in March and we quickly adapted to working remotely. Stacy Miller, our Chief Administrative Officer did an outstanding job of transitioning staff to remote work and their efforts to keep things running smoothly have contributed to maintaining a high level of productivity in spite of massive change. We moved our standing meetings to virtual platforms, and I am proud of our entire staff for how they handled and responded to this challenge.

The residency program continues to thrive under the direction of Dr. Kia Shahlaie. In June we celebrated the graduation of Dr. Seun Omofoye with a virtual ceremony simultaneously broadcast on Facebook Live. With the help of resident physicians Drs. Dylan Goodrich and Tejas Karnati, we created a program video to highlight the strengths of our program and the role we have in our community. In December we completed two full days of resident applicant interviews which took significant planning and effort by both Dr. Shahlaie and Staci Leitner. I appreciate their willingness to embrace change and their creative approach to problem solving.

Our Advanced Practice Providers moved to a 1:1 model this year which has been positively received. Their contributions to providing outstanding patient care and throughput have improved communication and patient satisfaction and we value their efforts.

We welcomed Dr. Amy Brooks-Kayal in October as she moved into her role as Professor and Chair and the Andrew John Gabor, M.D., Ph.D., Presidential Endowed Chair of the Department of Neurology. I look forward to the continued collaboration and partnership between both departments.

In January of 2021, Patrick Fuller, Ph.D. will join our research program as a professor and the vice-chair of research. Dr. Fuller brings a wealth of research experience, mentorship and leadership, and we look forward to his contributions to our research program.

I thank each member of the department for your willingness to adapt and the flexibility you have demonstrated throughout 2020. Despite much change, we continue to thrive, and it is through our teamwork, collaboration, mutual respect and coordinated efforts to prioritize patient care and education, that we are able to overcome the most pressing of challenges.

I look forward to our continued departmental growth and excellence in 2021.
We were pleased to add four new faculty members to the Department of Neurological Surgery in 2020.

Allan Martin, M.D., Ph.D.
Spine
Dr. Martin earned his Medical Degree in 2011 at the University of Toronto and completed his Ph.D. in 2017 at the University of Toronto, Institute of Medical Sciences Surgeon Scientist Training Program. He graduated from the neurological surgery residency program at the University of Toronto in 2019 and completed a spinal fellowship in June of 2020. Dr. Martin works closely with Drs. Kee Kim and Julius Ebinu in the Comprehensive Spine Center.

Branden Cord, M.D., Ph.D.
Cerebrovascular
Dr. Cord completed a neurovascular fellowship in 2020 at Yale-New Haven Hospital in New Haven, Connecticut. He earned his Medical Degree and Doctor of Philosophy in Medical Science in 2012 at Stanford University. Dr. Cord graduated from the Neurological Surgery Residency Program at Yale-New Haven Hospital in 2019 and completed an enfolded neurointerventional fellowship in 2017. Dr. Cord joins Dr. Ben Waldau in providing cerebrovascular neurosurgical services here at UC Davis.

Jeffrey Vitt, M.D.
Neurocritical Care
Dr. Vitt earned his Doctor of Medicine at the Georgetown University School of Medicine in Washington, DC in 2014. He graduated from the Neurology Residency Program at the University of California, San Francisco in 2018 and completed his Clinical Fellowship in Neurocritical Care also at the University of California, San Francisco in June of 2020. Dr. Vitt works closely with Drs. Martin and Zimmermann on the neurocritical care service.

Orwa Aboud, M.D., Ph.D.
Neuro-Oncology
Dr. Aboud earned his medical degree at Damascus University in 2007. He completed his Ph.D. in neurobiology and neurosciences in 2013, and his residency training in neurology in 2017 at the University of Arkansas for Medical Sciences. Dr. Aboud has completed a three-year program in clinical and research neuro-oncology training at the joint National Cancer Institute and Johns Hopkins University. His research includes designing clinical trials for glioblastoma patients. Dr. Aboud joined the department in August and works closely with Dr. Bloch in our Brain Tumor Program.
Patrick M. Fuller, Ph.D., joins the faculty in January of 2021. Dr. Fuller is a UC Davis graduate. He earned his M.S. in Exercise Physiology in 2001 and his Ph.D. in Molecular, Cellular and Integrative Physiology in 2004, both at UC Davis. Dr. Fuller completed a neuroscience fellowship in the Department of Neurology at Beth Israel Deaconess Medical Center in 2007 and has been working in the Division of Sleep Medicine as an Associate Professor of Neurology at Harvard Medical School and Beth Israel Deaconess Medical Center.

Dr. Fuller was recruited to the Department of Neurological Surgery as a Target of Excellence recruitment. He has garnered significant extramural funding as the Principal Investigator for (3) R01 grants and Co-Principal Investigator on two additional R01’s. His investigative efforts focus on the cellular and synaptic basis by which the brain regulates sleep, wakeful consciousness and circadian rhythms, aligning with evidence that suggests sleep and biological clocks impact neurological function. Using transgenic mouse models and optogenetics, Dr. Fuller has made meaningful contributions to understanding how the specific neural circuits and brain regions regulating sleep onset and timing are controlled. Dr. Fullers work will compliment current department research efforts in electrophysiological approaches to TBI, epilepsy and cognition.

Open Faculty Recruitments

The Department of Neurological Surgery is currently engaged in the following active faculty searches:

- Functional Neurosurgeon
- Pediatric Neurosurgeon
- Part-time Spinal Neurosurgeon
- Neuroprosthetics Researcher

Faculty recruitment listings can be located on https://www.recruit.ucdavis.edu
The separation surgery for Abigail and Micaela Bachinskiy began on October 24th and lasted 25 hours. It took months of planning meetings, and virtual simulation sessions and an incredible amount of organization and teamwork for this surgery to be a success. We appreciate the contributions of everyone who participated in this extremely rare opportunity to separate the twins; however, we are especially proud of our faculty members, **Dr. Michael Edwards**, **Dr. Kia Shahlaie** and **Dr. Marike Zwienenberg**. The entire team was comprised of over 30 people and included surgeons, anesthesiologists, nurses and key surgical staff and the surgery took place in the UC Davis Children’s Surgery Center in an operating room specifically built for complex cases such as this. The girls went home in late December and have made remarkable progress.
Read the article: Rare set of conjoined twins successfully separated in 24-hour surgery at UC Davis Children’s Hospital and watch the 5 part video series: Conjoined Twins Separation.

We appreciate all of the effort that went into planning and preparing for this complex surgery and applaud Drs. Edwards, Shahaie and Zwienenberg, and the entire team on this outstanding achievement.
Confronting

Brain Tumors

UC Davis Neurological Surgery is the first in the region to add NeuroBlate’s Laser Interstitial Thermal Therapy (LITT) to its arsenal of tools for the treatment of brain tumors. In August of 2020, Dr. Orin Bloch, Director of the Brain Tumor Program, used LITT’s minimally invasive laser technology to dissolve a patient’s brain tumor and the patient was able to return home the following day. This technology will be particularly useful for treating patients with small or recurring tumors. LITT may also be used to treat Epilepsy in both adults and children.

For additional information about NeuroBlate in the Sacramento region, patients and referring physicians can contact the UC Davis Health Brain Tumor Program at 916-731-1098.
UC Davis Health Neurological Surgery is home to a robust multidisciplinary adult and pediatric brain tumor program which spans several departments. We are dedicated to providing the highest quality of care to our patient population and to conducting breakthrough research in immunotherapy and the discovery and application of novel brain tumor treatments.

We are the largest Brain Tumor Program in North Central California with a catchment that extends into Nevada and Oregon. We perform over 500 brain tumor procedures annually, treating gliomas, meningiomas, craniopharyngiomas, skull base tumors, head and neck malignancies, chordomas, pituitary tumors, acoustic neuromas, metastatic tumors, and more. We provide full disease management.

We utilize brain and motor mapping, intraoperative neuromonitoring and use both awake and asleep craniotomies for eloquent tumors.

In addition to LITT, we are approved for Brachytherapy treatment using GammaTile Therapy to treat gliomas and recurrent metastasis. The brain metastasis program utilizes both the IKON Gamma Knife and LINAC Stereotactic Radiosurgery and surgical resection.

We are fully equipped with BrainLab and Stealth Navigation systems and software for brain tumor and skull based resections.
UC Davis Neurological Surgery is using mixed reality goggles to help provide optimal patient care. Utilizing the MagicLeap Goggle system we are able to load MRI’s and CT scans into a planning station and examine and manipulate virtual models to plan for highly complex procedures. In addition to surgical planning, this is an outstanding teaching tool, which helps us educate students, residents and families. This system is a remarkable advancement and helps us provide the very best clinical care for our patients.
Advancing Clinical Research

UC Davis Neurological Surgery is continuously improving the ways in which we deliver outstanding neurological surgical care. From artificial discs and bone modeling studies to finding ways to measure intracranial pressure and brain tissue oxygenation in our traumatic brain injury patients, we are dedicated to working at the frontier of discovery and innovation. With a team of physician investigators and clinical research specialists we seek novel ways to impact change and create optimal outcomes for our patient population. The studies mentioned here are open to enrollment.

Dr. Matthew Kercher, PGY-2 prepares to place a brain tissue oxygen monitoring device (PbtO2) in a traumatic brain injury patient as part of the Brain Oxygen Optimization in Severe TBI (BOOST3) study. BOOST3 is a multi-center trial led by Dr. Lara Zimmermann here at UC Davis.
Understanding the connection between traumatic brain injuries and the development of epilepsy is one of our highest priorities. Our clinical investigators take a collaborative approach and work with investigators and researchers from other institutions to collect and analyze data in the pre-clinical phase and translational research phases to help us find effective treatments.

**Epilepsy Research**

UC Davis Health is ahead in the race to enroll subjects in the Epilepsy Bioinformatics Study for Antiepileptogenic Therapy (EpiBioS4Rx). This large, multicenter study is designed to increase collaborative research efforts across multidisciplinary teams of basic and clinical neuroscientists with access to extensive patient populations. UC Davis is one of 13 TBI Centers that will follow patients for two years.

**Imaging of Glial Activation and Risk for Post Traumatic Epilepsy**

Dr. Ryan Martin is the Principal Investigator on this Department of Defense Congressionally Directed Award designed to better understand epilepsy in patients with acute TBI. We are enrolling 30 patients for this study.

**UC Davis – David Grant Medical Center TBI Neural Network-Precision Medicine Paradigm for Complex Trauma**

Dr. Ryan Martin and Dr. Tina Palmieri are co-PI’s on this grant.
Spine Studies

The Department of Neurological Surgery at UC Davis Health is advancing spinal health by evaluating new treatments such as stem cell use for disc regeneration and bony healing, dural sealants, and disc replacement technologies. Led by Dr. Kee Kim, Co-Director of the Spine Clinic, we are enrolling subjects in multiple investigations.

Below: Dr. Allan Martin and Chief Resident Dr. Amir Goodarzi participate in a pivotal clinical trial evaluating the safety and effectiveness of Adherus™ AutoSpray and Adherus™ Autospray ET dural sealant when used as a dural sealant in spinal procedures. Primary Investigator: Kee D. Kim, M.D.

The purpose of the study is to demonstrate that Adherus Dural Sealant is safe and effective at achieving water-tight closure when used as an adjunct to standard methods of dural repair for spinal procedures as compared to DuraSeal Exact.
Four faculty members of the Department of Neurological Surgery were honored by Sacramento Magazine for being among the region’s Top Doctors. Two hundred and forty UC Davis Health physicians were listed in more than 61 specialty areas. Dr. Zwienenberg was honored in both the adult and pediatric medicine. The list is compiled by Professional Research Services, LLC, a third-party firm and is based on peer-review surveys.

Griffith Harsh, M.D., M.B.A.
Professor and Chair
Department of Neurological Surgery

Kee D. Kim, M.D.
Professor and Co-Director
UC Davis Spine Center

Kiarash Shahlaie, M.D., Ph.D.
Professor and Program Director
Department of Neurological Surgery

Marike Zwienenberg, M.D.
Associate Professor
Department of Neurological Surgery
Congratulations to our 2020 Residency Program Graduate!

Oluwaseun Omofoye, M.D. was our 2020 Residency Program Graduate. Dr. Omofoye earned an M.S. in mechanical engineering in 2007 from Columbia University. He completed his Medical Degree and first 5 years of neurosurgery residency at the University of North Carolina. He completed a clinical neurosurgery fellowship at Boston Medical Center and joined the UC Davis Neurological Surgery Residency Program in 2018. He exhibited phenomenal clinical growth and academic productivity. He is a superb physician, excellent surgeon and he has been an outstanding Chief Resident, who was admired for demonstrating calm, capable leadership and adroitly managing an extremely busy service. By the end of his residency, Dr. Omofoye had amassed an impressive publication and presentation record and was the selected recipient of the 2019-2020 James E. Boggan Resident Scholar Award. We wish him the very best as he transitions into his yearlong fellowship in neurosurgical oncology at Cedars-Sinai in 2021 and into his neurosurgery career. We hope to bring Dr. Omofoye back to UC Davis in 2021 for an in-person graduation ceremony.
Residency Program News

The Department of Neurological Surgery welcomed two new interns on July 1, 2020, Jose Castillo, M.D. who graduated from Virginia Commonwealth University and Irene Falk, M.D., who graduated from the Medical College of Augusta University.
Catherine (Kate) Peterson, M.D. and Dylan Jake Goodrich, M.D. joined the department in March. Dr. Peterson graduated from Indiana University and is a PGY-6 and Dr. Goodrich graduated from St. George’s University and is a PGY-4.

Chief Residents
Resident physicians Amir Goodarzi, M.D., and Joti Thind, M.D., took the helm as co-chief residents in July and will serve until June 30th of 2021. Together, they do an excellent job of managing all scheduling assignments and disseminating important information to our residents.
Residency Program News

**Dr. Bart Thaci** returned to UC Davis after a yearlong enfolded endovascular neurosurgery fellowship at the University of Alabama in Birmingham. His abstract, “Outcomes after thrombectomy for proximal and distal M1 occlusions,” Thaci B, Chagoya G, Elsayed G, Salehani A, Pope B, Bernstock J and M Harrigan, was accepted at the 2020 AANS Annual Scientific Meeting.

**Edwin Kulubya, M.D.,** was honored by the nursing staff of the Midtown Neurosurgery Clinic for his outstanding contributions. Clinic Manager, Floreece Johnson remarked that, “As a neurosurgery resident, Edwin has gone above and beyond in teaching nursing staff. He is always willing to answer questions and discuss rationale behind clinical decisions. Recently, he took the time to present a case review to the nursing staff on skull base fractures while being on-call. His presentation was engaging and thoughtful. His dedication to the nursing staff is greatly appreciated.” Dr. Shahlaie presented Dr. Kulubya with a certificate and a pin.

The **Neurological Surgery Resident Workroom** has undergone a much needed redesign and is now a more functional workspace. With additional workstations, computers, storage cubbies, backpack hooks and a closet to store lab coats, we hope this brings more functionality to the space.

A special note of thanks goes to **Dr. Tejas Karnati** and **Dr. Dylan Goodrich** for their hard work in developing our department’s residency applicant video featured on the applicant page on our resident website. They did a fantastic job of renting special video equipment to facilitate faculty interviews and then editing the video, adhering to the requirements set by UCDH Graduate Medical Education. We appreciate all the hard work that went into making the video. Here they are recording Dr. Ben Waldau.
The Program Director’s Corner
Kia Shahlaie, M.D., Ph.D.

2020 was a year of many firsts for the UC Davis Department of Neurological Surgery. We held our first virtual graduation to honor Chief Resident and graduate, Dr. Seun Omofoye, a talented surgeon, fantastic doctor and highly effective leader and chief resident.

Due to our program’s phenomenal growth over the past two and a half years, we now have two co-chief residents who took over Dr. Omofoye’s responsibilities on July 1 of 2020. Co-chief residents, Drs. Joti Thind and Amir Goodarzi have done an excellent job coordinating their shared scheduling and management responsibilities and we value their efforts to keep our team up to date and running smoothly.

We held our first virtual resident applicant interviews using Zoom in December. I want to commend Staci Leitner for the time and effort that went into ensuring the interviews were a success. We held two fully scheduled interview days and are excited to see the outcome of the 2020-21 residency match. There were many outstanding applicants and come July of 2021, we will be at our full complement of 14 neurological surgery residents, another first.

Due to the pandemic, we restructured our training program, and quickly began delivering lectures, training and even morning rounds on virtual platforms to facilitate social distancing. We have remained flexible and adaptable in dealing with the challenges brought by COVID-19 throughout the year.

In December, our residents were among the first in the country to receive the Pfizer COVID-19 vaccine and they recently received their second dose. We faced some remarkable challenges in 2020 and met those with creative problem solving and resilience. We look forward to a restoration of more normalized operations in 2021 and will integrate some of what we learned about the use of virtual platforms to continue to extend our educational reach. We are excited and looking forward to 2021!
2020 Resident Academic Productivity

Journal Manuscripts


Book Chapters:

Published Abstracts:

Presentations:


Advanced Practice Providers

Our advanced practice providers in the Department of Neurological Surgery added several new team members in 2020:

- Katherine Chirco, M.S.N., N.P.
- Anthony T. Nye, M.S.N., R.N.P.
- Megan Rye, M.S.N., N.P.

Congratulations to the 2020 UC Davis Health APP Fellowship Program Graduate, Nicole Gunadi, N.P. We are pleased that Nicole will be joining the department’s APP team in January of 2021.

Under the leadership of Christine Picinich, N.P., the department’s APP program continues to thrive in the one on one model (M.D. – Advanced Provider) which facilitates comprehensive patient care in that our APP’s provide care for their patients throughout the course of their treatment.
The Brain Tumor Support Group was formed in 1990 to provide emotional support and educational programs to tumor patients and their families and friends. The group is open to all patients with benign or malignant brain tumor disease at any stage. Patients' family members are encouraged to participate and membership is free. The group meets the first Wednesday of every month from 6:30 to 8:00 p.m. on a virtual platform.

The Brain Aneurysm Support Group provides hospital visitation, telephone support and monthly meetings to help you connect with other people who are facing treatment, recovering, or supporting someone who has experienced aneurysm. The support group meets monthly and covers a variety of important topics for aneurysm patients and their families. Meetings are the fourth Saturday of every month, 3-5 p.m. on a virtual platform. For more information about participating in the aneurysm or tumor support groups, contact Breana Sanchez at bnsanchez@ucdavis.edu.

The Deep Brain Stimulator Support and Education Group is open to patients, caregivers, and family who have or are considering a deep brain stimulator for a movement disorder such as Parkinson's disease, tremor or dystonia. Monthly topics and guest speakers will help participants learn more about living with a stimulator and Parkinson's Disease. Meeting days and locations for the Deep Brain Stimulator Support Group are currently virtual. For more information on how to participate, Laura Sperry at lmsperry@ucdavis.edu.
Thank you for choosing UC Davis Health and the Department of Neurological Surgery for your patient referrals, transfers and phone consults.

**Referring Physicians:**
- Acute care transfers, direct admissions, urgent pediatric telemedicine 1-800-482-3284 Option #1
- Phone consultations: 1-800-482-3284 Option #2
- Outpatient referrals, 1-800-482-3284, Option #3.
  You may also submit an [Electronic Referral Form](#) or use the [Referral Request Kit (pdf)](#)
- Visit our [Physician Referral Website](#)

**Prospective Patients** are encouraged to visit our [Consumer Resource Center](#) or call 1-800-282-3284 for new patient and general information.
With Gratitude:

The Department of Neurological Surgery is deeply grateful for the support our donors provide. Donor contributions can provide a wide variety of assistance to the department, from helping residents purchase much needed supplies, to helping us build programs, purchase equipment and recruit for faculty in emerging areas of neurosurgery and neuroscience that are poised to make a significant impact on how we deliver the best care possible to our patients.

We are committed to providing the very best in neurological patient care and resident training Northern California. Donor support helps us achieve that vision. We hope to support the following areas with your future philanthropic gifts to the Department of Neurological Surgery:

- Resident Education
- Program Development for Epilepsy Treatment
- Recruitment of a Senior Scientist

Make a gift:

Health Sciences Development and Alumni Relations is charged with building philanthropic support for UC Davis Health patient care, research and education programs. To make a gift please contact:

**Jennifer Marsteen, CFRE**
Director of Development Health Sciences Development
4900 Broadway, Suite 1830
Sacramento, CA  95820 Phone: 916-734-9448


Ondek K, Lucero S, Zwienebenberg M, Gurkoff G. An implantable helmet for studying repeat TBI. MethodsX.


Astrocyte-synapse interactions in a rat model of Alexander disease
Berman R
NIH National Institute of Neurological Disorders and Stroke
April 2019 to March 2020

B7H1 mediated immunosuppression in glioma
Bloch O
NIH National Cancer Institute
7RO1CA16471414-07
June 2019 to June 2020

Representation of spatiotemporal information in human episodic memory and navigation
Ekstrom A, Gurkoff G, Shahlaie K
National Institutes of Neurological Disorders and Stroke
NIH R01 NS 076856
July 2018 to June 2022

A concurrently controlled study of the LimiFlex Paraspinous Tension Band in the treatment of lumbar degenerative spondylolisthesis with spinal stenosis
Kim K
Empirical Spine, Inc.
January 2018 to June 2027

Hyperbranch Med Spine Dura Sealant Study
Kim K
Hyperbranch Medical Technology, Inc.
October 2019 to October 2020

Deep degenerative lumbosacral spinal conditions
Kim K
Medtronic Sofamor Danek USA, Inc.
June 2017 to February 2020

Randomized, controlled, single-blind study of probable benefit of the Neuro-Spinal Scaffold™ for safety and neurologic recovery in subjects with complete thoracic AIS A spinal cord injury as compared to standard of care
Kim, K
Invivo Therapeutics Corporation
August 2018 to August 2020

A multicenter, randomized, doubleblind, sham-controlled, comparative study of SI-6603 in subjects with lumbar disc herniation (Phase 3)
Kim, K, Copenhaver D
Seikagaku Corporation
July 2018 to May 2021

Confirmatory clinical study to support the effectiveness and safety of OxiPlex® for the reduction of pain and symptoms following lumbar surgery
Kim K, Ebinu J
Fziomed, Inc.,
September 2018 to September 2021

Imaging of glial activation and risk for post-traumatic epilepsy
DoD Congressional Directed Medical Research Program
Martin R, Zimmermann L, Gurkoff G, Badawi R, Harvey D
August 2019 to August 2022

Electrocorticography of human prefrontal cortex during value-based decision-making
Saez, I
NIH National Institute of Mental Health
5K01MH108815-03
April 2019 to July 2020

Deep brain stimulation of the medial septal nucleus in epilepsy
Shahlaie K
UC Davis School of Medicine Dean's Grant 2018 to 2020
Thank you for inspiring us to accomplish more!

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