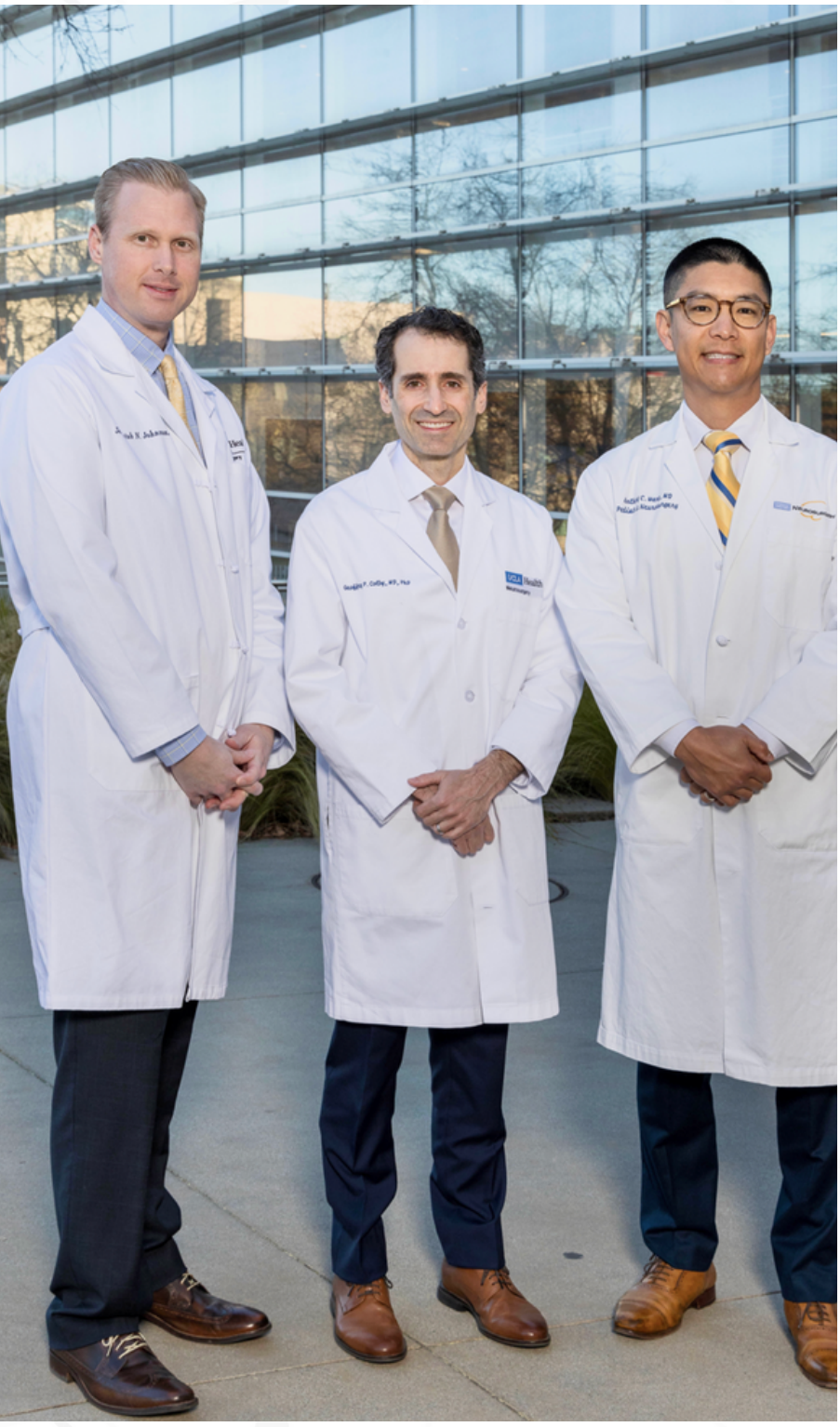
SPRING | 2023

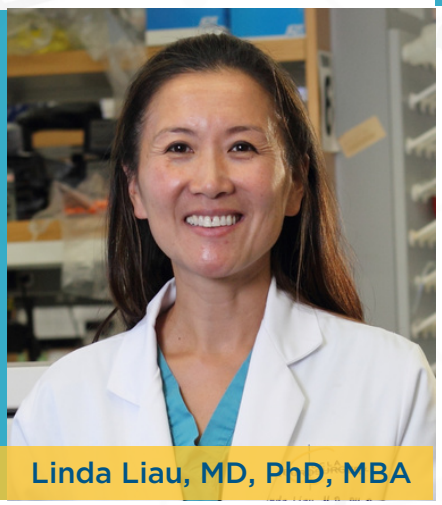
UCLA Neurosurgery Connections

CEREBROVASCULAR EDITION



UCLA Health

FROM THE CHAIR



Linda Liau, MD, PhD, MBA

Professor and W. Eugene Stern Chair
Chair and Executive Medical Director
UCLA Department of Neurosurgery

"Our faculty and residents continue to advance the field with numerous high-impact publications, patent applications, and novel clinical trials."

Dear Colleagues and Friends,

Welcome to the Spring 2023 Edition of the UCLA Neurosurgery Connections newsletter!

As the W. Eugene Stern Professor, Chair, and Executive Medical Director of the Department of Neurosurgery at UCLA Health, I am delighted to share some exciting updates about our department.

We've had another great year at UCLA Health, including a top 5 ranking among academic medical centers for Quality & Accountability from Vizient, as well as a top 5 Best Hospital ranking from U.S. News and World Report. We continue to excel in our highly complex subspecialties and are currently #1 for Cancer Care in California.

The UCLA Neurosurgery Department has risen to #2 in NIH funding nationally, with about $15 million per year in NIH grants; and our faculty and residents continue to advance the field with numerous high-impact publications, patent applications, and novel clinical trials.

In this edition of the newsletter, we will highlight a selection of the innovative research and clinical advancements occurring in our Cerebrovascular Division.

From cutting-edge discoveries that expand future therapeutic possibilities for cerebral vasospasms (page 2), to the use of middle meningeal artery embolization (MMA) as a minimally invasive treatment for chronic subdural hematomas (page 3), our Cerebrovascular team is paving the way towards better solutions for common cerebrovascular disorders. Additionally, breakthroughs in cerebrovascular surgical techniques, such as the novel endovascular transmural approach to the perivascular tissues (page 4) and the feasibility of a maxillary artery to middle cerebral artery bypass (page 5), open the door for safer and more effective treatments to improve patients' quality of life.

UCLA Neurosurgery is committed to excellence, innovation, and to the successful development of future treatments in our field. From all of us at the UCLA Department of Neurosurgery, we wish you good health and the best to you and your families!

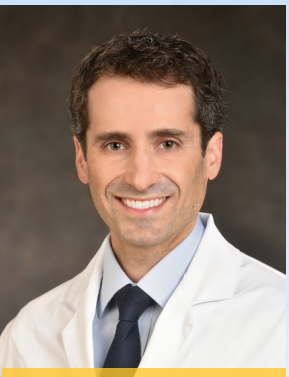
Warm regards,

Linda M. Liau

FUTURE TREATMENT ADVANCES

Swine Model Expands Knowledge and Possibilities for Cerebral Vasospasm Treatment

Blood flow in the brain is highly regulated by a variety of synergistic internal processes known as autoregulation. However, if these processes are disrupted by an event like a subarachnoid hemorrhage or an aneurysm, cerebral vasospasm might occur. Cerebral vasospasm arises when the blood vessels in the brain narrow, which can lead to stroke and other poor patient outcomes. Cerebral vasospasm is particularly prominent in patients with ruptured brain aneurysms and traumatic brain injuries.



Dr. Geoffrey Colby

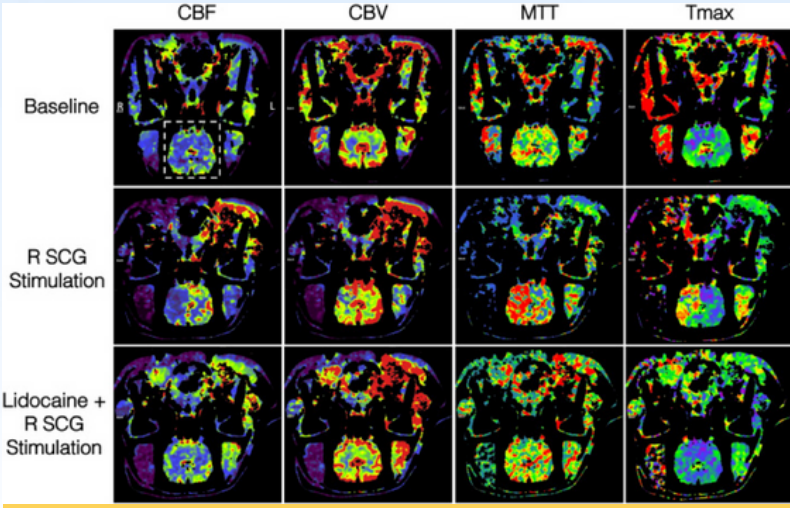
The cerebral vasculature is innervated by a bundle of nerves originating from the superior cervical ganglion (SCG), which contributes to cerebral vasospasm when activated. Dr. Geoffrey Colby and Dr. Anthony Wang, along with a cadre of other interdisciplinary collaborators at UCLA, including fifth year Neurosurgery residents Dr. Jason (Wi Jin) Kim and Dr. Milan Samarage, investigated whether the stimulation of the SCG in swine can lead to a deficit in cerebral blood flow, also known as cerebral hypoperfusion. This condition is similar to cerebral vasospasm in humans. Thus, if cerebral hypoperfusion can be triggered by stimulation in the SCG in the swine model, this finding could have significant implications for the treatment of cerebral vasospasm in humans.

Currently, there are few treatment options for patients suffering from cerebral vasospasm. Those that exist, such as utilizing intra-arterial calcium channel blockers or balloon angioplasty, are short acting or can put patients at a higher risk of developing additional injuries. Further treatments for this condition are therefore necessary to improve patient outcomes.

The researchers identified and electrically stimulated the SCG in swine. Blood flow was monitored to assess the impact of this stimulation. In addition, the researchers tested whether inhibiting the SCG with lidocaine prior to stimulation could lead to an improved rate of cerebral perfusion.

The researchers discovered that stimulating the SCG resulted in a deficit of cerebral perfusion in the swine model that mimicked what is found in cerebral vasospasm. By contrast, they found that inhibiting the SCG pathway during stimulation restored perfusion to baseline. Although these findings were derived from a swine model, they indicate a promising step forward towards better treatment options for human cerebral vasospasm. Specifically, future investigation into the inhibition and stimulation of the SCG may further elucidate this relationship and lead to more therapies for cerebral vasospasm in humans.

Read the full article here.



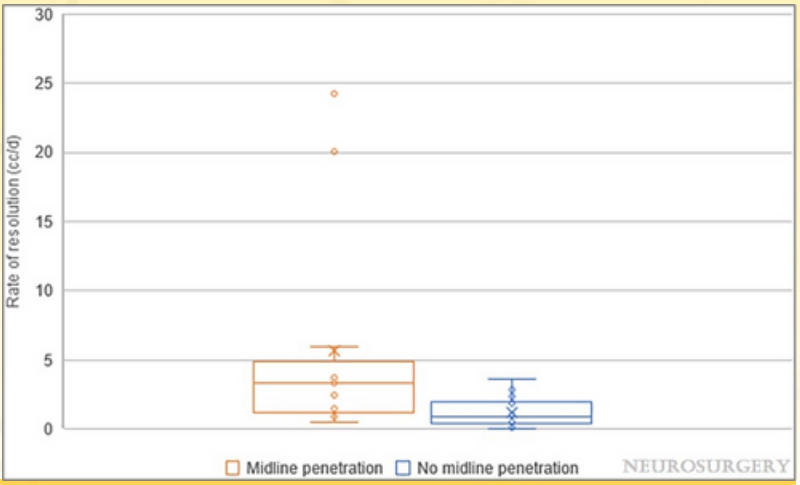
These scans show cerebral perfusion in the swine brain at baseline, with superior cervical ganglion (SCG) stimulation, and with lidocaine plus SCG stimulation.

MINIMALLY INVASIVE THERAPIES

Minimally Invasive Procedure is Associated with Quicker Resolution of Chronic Subdural Hematomas

Chronic subdural hematomas (CSDHs) arise when a clot of blood appears on the surface of the brain, liquifies over time, and becomes surrounded by inflammatory membranes. These clots most often develop in the elderly after trauma or can occur spontaneously, although they are more common in individuals taking certain antiplatelet or anticoagulation medications. Unfortunately, CSDHs are associated with increased mortality rates within these types of patients. The incidence of CSDHs is anticipated to increase due the aging population, which makes them a particularly pressing subject for research.

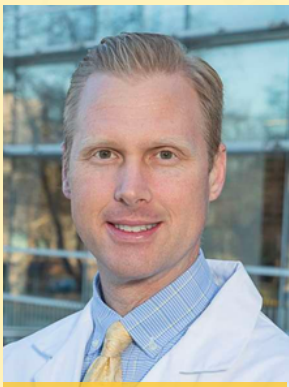
Middle meningeal artery (MMA) embolization has recently emerged as a treatment for CSDHs. In contrast to other treatment options, such as Burr hole drainage which involves drilling into the skull to drain the hematoma, MMA embolization is a minimally invasive procedure. During MMA embolization, small catheter tubes are inserted into the head to target the blood vessels in the inner lining of the skull (the dura).



The rate of resolution for patients who underwent middle meningeal artery (MMA) embolization with midline penetration for chronic subdural hematomas (CSDHs) was significantly higher than those who had no midline penetration.

Substances injected through these tubes help the surgeon block the MMA, which results in the shrinking of the subdural hematoma over time.

Cerebrovascular neurosurgeons Dr. Geoffrey Colby, Dr. Anthony Wang, and Dr. Jeremiah Johnson, along with Neurosurgery residents Dr. Milan Samarage and Dr. Jason (Wi Jin) Kim, collaborated with other interdisciplinary researchers from UCLA to analyze a retrospective series of cases of MMA embolization for CSDHs. The researchers aimed to demonstrate the effectiveness of this procedure and whether it improved the rate at which CSDHs were resolved.



Dr. Jeremiah Johnson

To do this, the researchers studied all patients at UCLA who underwent MMA embolization for CSDHs between January 2017 and June 2021. In total, the results from thirty-seven procedures were analyzed. In 84% of these patients, there was a reduction in the volume of the CSDH, while 49% had a complete resolution of their CSDH. Most importantly, the researchers discovered that when the MMA embolization was conducted so there was penetration of embolic material to the midline (an area of the dura called the falx), the rate of CSDH improvement was higher.

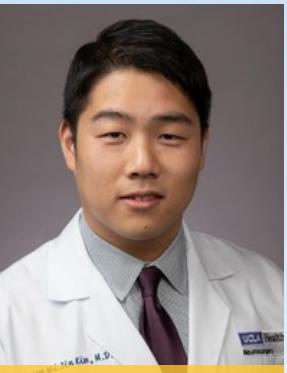
These findings indicate that MMA embolization is an effective, minimally invasive treatment for CSDHs. MMA embolization can be an attractive option, especially for patients where other treatment options might not be possible or recommended.

Read the full article here.

NOVEL SURGICAL APPROACHES

Safety of a Novel Endovascular Transmural Approach to the Perivascular Tissues Creates Possibilities for New Targeted Therapies

Perivascular tissues surround the blood vessels. The perivascular tissues residing in the cranial and cervical areas are particularly significant due to their proximity to structures that control important body functions. Unfortunately, this proximity also means that surgically accessing these areas can be challenging due to the sensitivity of the surrounding structures. However, recent advances in endovascular technology enable these tissues to be accessed and targeted more easily.



Dr. Jason (Wi Jin) Kim

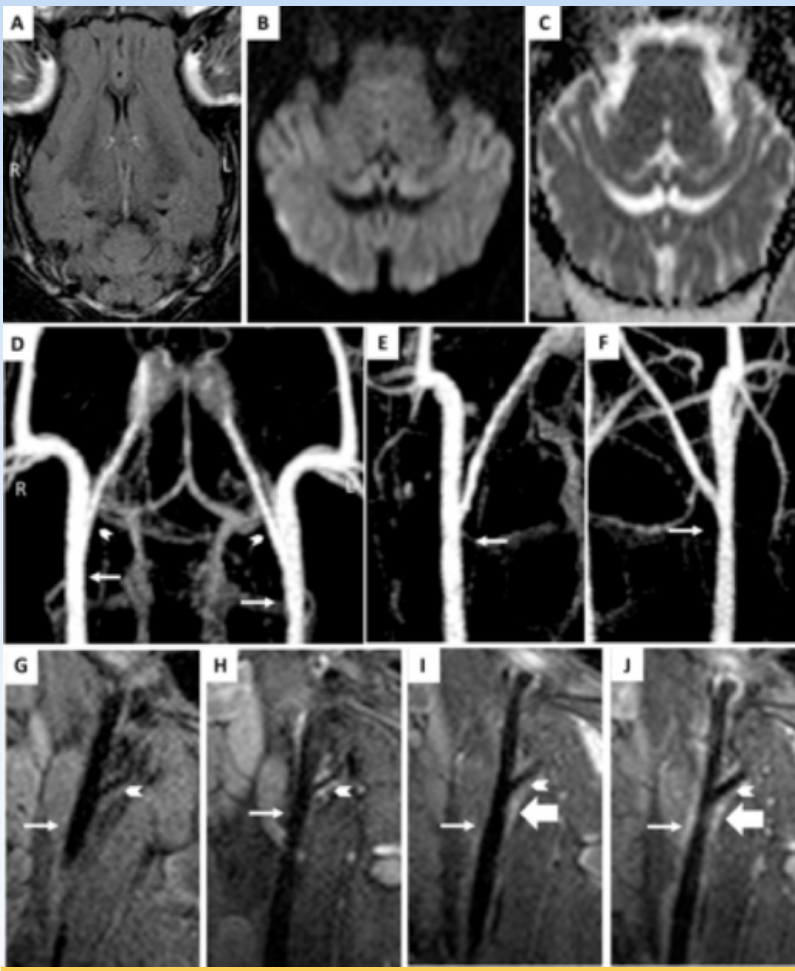
Dr. Milan Samarage

Dr. Jason (Wi Jin) Kim and Dr. Milan Samarage worked with Dr. Anthony Wang, Dr. Jeremiah Johnson, and Dr. Geoffrey Colby to determine the safety of a novel endovascular transmural approach designed to target the perivascular tissues of the carotid artery in a swine model.

To accomplish this, the researchers used a device to puncture tiny holes into the carotid artery of swine. This allowed them to access the perivascular tissues for drug delivery using a novel endovascular transmural approach. The swine were then monitored through MRI, MR angiography, and digital subtraction angiography for any vessel injury or cerebral ischemia.

The researchers discovered that none of the carotid arteries showed signs of vessel injury, intravascular thrombosis, or other relevant deficits. Thus, this suggests that using a novel transmural approach to gain access to the perivascular tissues is safe in a swine model. These findings open the door for the discovery of new treatments targeting the perivascular structures in humans, such as the structures of the autonomic nervous system.

Read the full article here.



The above image includes the representative MRI and magnetic resonance angiography (MRA) scans that were used to assess for stroke, neck hematoma, and vessel injury after the perivascular tissues were accessed through the novel endovascular transmural approach.

INNOVATIONS IN TECHNIQUE

Anatomic Feasibility of Maxillary Artery to Middle Cerebral Artery Bypass Enables Additional Treatment Options

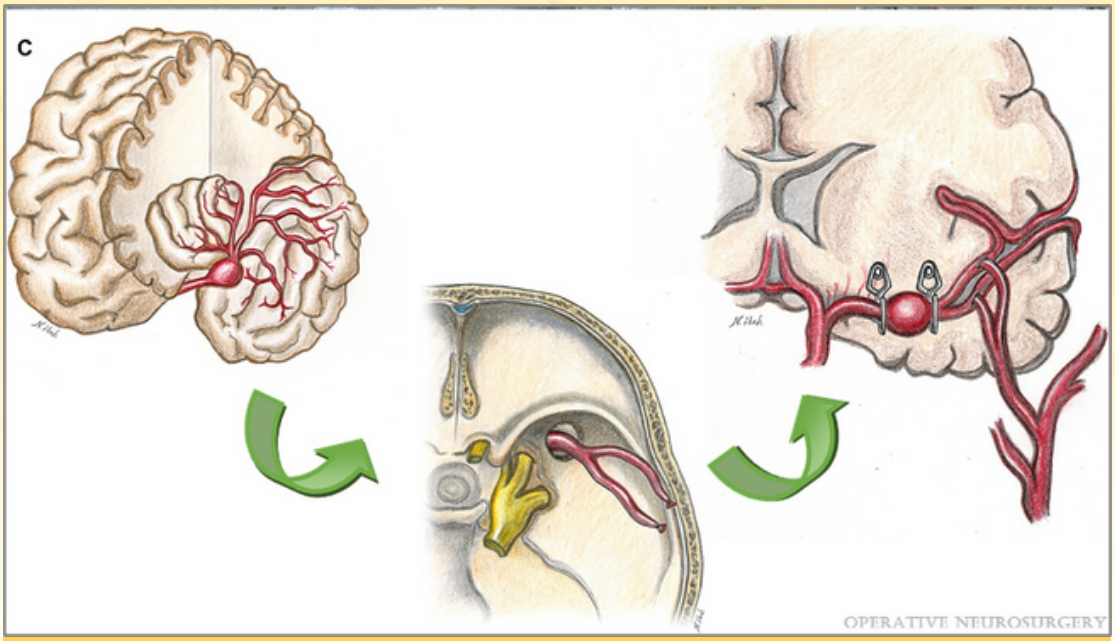
Extracranial-to-intracranial bypass is a versatile form of surgery that is used to treat various types of cerebrovascular disorders, including aneurysms, conditions that can cause stroke, and tumors. This type of procedure can necessitate the use of a vascular graft, which is often taken through separate incisions from other parts of the body.

Our UCLA Neurosurgery cerebrovascular team worked with brain tumor neurosurgeons Dr. Marvin Bergsneider and Dr. Won Kim and other interdisciplinary collaborators at UCLA to investigate whether the internal maxillary artery (IMAX) can be harvested through a new, minimally-invasive endoscopic approach to be used as a donor for extracranial-to-intracranial bypass.

To conduct this study, the researchers utilized a combination of cadaveric dissections and advanced surgical simulations. Ultimately, the researchers discovered that a trans-nasal, trans-maxillary approach is a feasible way to endoscopically harvest the IMA. This discovery can be a valuable addition and alternative to more invasive bypass techniques for some patients in need of cerebrovascular revascularization.

Dr. Anthony Wang

Read the full article here.



A schematic depiction of how a pedicled internal maxillary artery (IMAX) graft could be used in the treatment of a large middle cerebral artery (MCA) aneurysm.

RESIDENT HIGHLIGHTS

DAVID GEFFEN SCHOOL OF MEDICINE AT UCLA
Residents and Fellows Award for Excellence in Teaching with Humanism

Awarded to: Dr. Jasmine Dicesare (Resident, PGY-7)

AMERICAN ASSOCIATION OF NEUROLOGICAL SURGEONS (AANS) - ELEKTRA AWARD
"pH-weighted imaging to visualize and characterize infiltrating glioblastoma cells"

Awarded to: Dr. Kunal Patel (Resident, PGY-7)

NIH-NINDS R25 GRANT
"Evaluating the mechanisms of cell death and tumor selectivity of cold atmospheric plasma in malignant glioma using a cerebral organic tumor model"

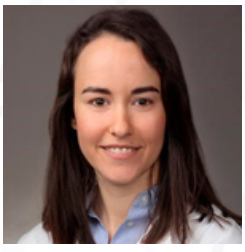
Awarded to: Dr. Sophie Peeters (Resident, PGY-6)

AMERICAN ASSOCIATION OF NEUROLOGICAL SURGEONS (AANS) - SOUTHEASTERN BRAIN TUMOR FOUNDATION AWARD
"EZH2 inhibition as a potential therapeutic avenue in the treatment of meningioma"

Awarded to: Dr. Joshua Casaos (Resident, PGY-4)

SIERRA SPINE SOCIETY
2023 Frank Acosta, MD Resident Research Award

Awarded to: Dr. TJ Florence (Resident, PGY-4)



NORTH AMERICAN SKULL BASE SOCIETY (NASBS) - BEST BASIC SCIENCE ABSTRACT AWARD
"Functional classification of apoptotic sensitivity in meningioma"

Awarded to: Dr. Maya Harary (Resident, PGY-4)

ACHIEVEMENTS

UCLA Health Designated as a Center of Excellence for the Treatment of Cavernous Malformations

The Alliance to Cure Cavernous Malformation recently designated UCLA Health as a Cerebral Cavernous Malformation (CCM) Clinical Center. UCLA Health is the only CCM Clinical Center in Southern California.

This designation is awarded to healthcare institutions that offer top-notch interdisciplinary care for both pediatric and adult cavernous malformations.

"The Alliance to Cure Cavernous Malformation is an important resource for patients and families that live with this complex disease, and we have worked side-by-side with them for many years," said Dr. Anthony Wang. "We are honored to receive this recognition, as we believe that it reflects the elite care, expertise, and dedication that our team at UCLA Health brings to the care of our cavernous malformation patients."

Cavernous malformations are abnormal groups of small blood vessels that develop in the brain and spinal cord. These clusters increase the risk of stroke, seizures, and brain hemorrhage in otherwise healthy patients. Brain and spinal surgery are the only treatments for cavernous malformations, although medications do exist to strengthen the blood vessels and thus potentially prevent the development of additional cavernous malformations.

The Alliance to Cure Cavernous Malformation is an organization dedicated to providing information and support for patients and families impacted by cavernous malformations. Learn more here.

CONNECT

Phase 2 Trial for Cavernous Malformations Marks Important Step Towards Additional Treatments

UCLA is one of twelve sites nationwide participating in a Phase 2 trial for a novel treatment for cavernous malformations. This trial marks a huge step towards better treatment options as it is the first large trial for a medication for cavernous malformations. Dr. Anthony Wang serves as the Principal Investigator at UCLA. If you are interested in this trial, please contact Melissa Arevalo at mfarevalo@mednet.ucla.edu.

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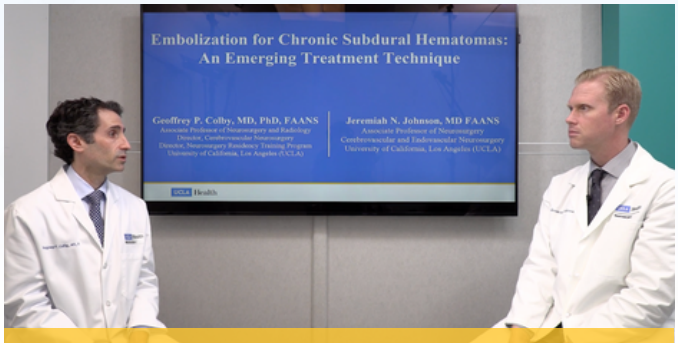
Upcoming Webinar Series Offers Insight into a Variety of Neurosurgical Topics

Dr. Jeremiah Johnson recently hosted a series of webinars featuring lectures by Neurosurgery faculty and interdisciplinary collaborators. The webinars feature a variety of topics, including Embolization for Chronic Subdural Hematoma, Superior Semicircular Canal Dehiscence, Endoscopic Transnasal Surgery for Pituitary and Anterior Skull Base Tumors, and Moyamoya Disease.

The series is set to be released on the UCLA Health YouTube page. Check here for more updates or visit the UCLA Neurosurgery social media accounts (Twitter and Instagram).



Dr. Geoffrey Colby (left) and Dr. Jeremiah Johnson (right)

NEW FACULTY

Dr. Maya Newman Appointed as New Pediatric Physiatrist

Dr. Maya Newman is a new Assistant Professor in the Physical Medicine and Rehabilitation division of the Department of Neurosurgery. She completed a Master's in Global Health Sciences at the University of California, San Francisco, her Medical Degree at the University of Washington, a residency in Physical Medicine and Rehabilitation at Baylor College of Medicine, and a fellowship in Pediatric Rehabilitation Medicine at Seattle Children's Hospital/the University of Washington.

Specializing in pediatric physiatry, Dr. Newman manages care for children with congenital or acquired conditions such as cerebral palsy, spina bifida, muscular dystrophies, spinal cord injury, brain injury, stroke, brain tumors, and post-surgical brain resections for epilepsy. She manages hypertonia, muscle weakness, bowel and bladder changes, gait abnormalities, motor delays, and can also help to identify patients who are good candidates for single event multilevel orthopedic surgeries, selective dorsal rhizotomy surgery, and intrathecal baclofen (ITB) pump placement. Pediatric physiatrists prescribe prosthetics and orthotics, therapies, and adaptive equipment as well as perform botulinum toxin injections, and manage post-operative ITB pumps.

Dr. Maya Newman

Dr. Newman's research passion concerns the climate crisis and how patients with disabilities are particularly vulnerable during natural disasters. She is vice president of the board of the international nonprofit organization, Sustain Our Abilities board, and her fellowship research focused on disaster preparedness for children with special healthcare needs.

AWARDS

Dr. Linda Liau Receives the Inaugural JEDI Trailblazer Award

On December 9, 2022, Dr. Linda Liau received the inaugural Justice, Equity, Diversity, and Inclusion (JEDI) Trailblazer Award. This award was presented in collaboration with the Asian American and Pacific Islander (AAPI) Faculty Alliance and BLNA Collective (Black, Latinx, and Native American Faculty Collective) at the David Geffen School of Medicine.

The JEDI Trailblazer Award is given to individuals who exhibit excellence in expanding the ideals of justice, equity, diversity, and inclusion.

"She is a role model for all us residents, but probably most so for the female residents," said Dr. Maya Harary, who is in her fourth year as a Neurosurgery resident. "She is only the second female Neurosurgery department chair in the history of our field, and the fact that we have had more and more female residents every year is due in large part to her."

You can learn more about the JEDI Trailblazer Award and see the video on Dr. Liau here.

Dr. Linda Liau (right) with fellow JEDI Award Recipients, Dr. Mary Marfisee (left) and Dr. Arthur Gomez (center).

APPOINTMENTS

Scheduling an Appointment as a Patient

To make an appointment with a UCLA neurosurgeon, please call 310-825- 5111 or visit our website for more information.

For information about spine related conditions and treatments, visit the UCLA Spine Center in Santa Monica.

Over the past several years, UCLA Health has been dedicated to making services more accessible to patients outside the immediate Los Angeles area. To make a Telemedicine appointment with a UCLA neurosurgeon, please visit our website or call 310-825-5111.

Referring as a Healthcare Professional

Our partnership with health professionals in the community is key to our success at UCLA Health. Registered nurses and referral coordinators are available to assist referring physicians. Case managers can access services at UCLA Health through the toll-free UCLA Physician Referral Service phone line 1-800-UCLA-888 (825-2888). Visit our website to learn more.

GIVING

Thank you for your interest in supporting the UCLA Department of Neurosurgery. Donations help fund innovative research that has the potential to alter patients' lives. We are grateful for your life-changing generosity.

Donate Now

If you would like more information, please contact:

Nora McCarl
Director of Development for UCLA Neuroscience
(310) 210-5795
nmccarl@mednet.ucla.edu

COMMUNITY

Neurosurgery Virtual Support Group

UCLA Neurosurgery is dedicated to providing patients and their families support during every step of their journeys. On the third Tuesday of each month from 5:30-7:00 PM, the Neurosurgery Patient and Family Advisory Council (NPFAC) hosts a Virtual Support Group open to all Neurosurgery patients, family members, and caregivers looking for support. The NPFAC is comprised of former patients and family members of those who have been treated for a variety of conditions, as well as faculty and staff from the Department of Neurosurgery. This support group aims to empower the patient and the caregiver in the care and recovery processes. If you are interested in learning more, please contact us at NPFAC@mednet.ucla.edu or click here to visit our website.

Third Annual Charity Volleyball Tournament

Last year, the Neurosurgery department hosted its Third Annual Charity Volleyball Tournament! The tournament was started by sixth-year resident, Dr. Sophie Peeters, and hosts residency programs from across the U.S. The event is designed to engender inter-program bonding and friendly competition while raising money to support the Neurosurgery Research Education Foundation (NREF).

We will be hosting the Fourth Annual Charity Volleyball Tournament in the Fall of 2023. Stay tuned for more information!