

## LETTER FROM THE CHAIR

# Preparing to Usher in a New Era of Neurosurgical Care as U-M's 'Hospital of the Future' Becomes Reality



We are coming to the end of another year, and as always, it has been a meaningful one in the U-M Department of Neurosurgery. Since finishing up our centennial year, we've had another busy twelve months, complete with many new challenges and much excitement.

Perhaps most notably, in September of this year, the Regents of the University approved the plan to build a new, state-of-the-art neuroscience-focused hospital on the University of Michigan's medical campus. The new hospital will be located in an area of campus that previously housed the Kresge Laboratories, which were torn down years ago. I have personally referred to this area as the "grassy knoll" for a number of years. It is located right next to the Frankel Cardiovascular Center. The new hospital will have 12 floors, with 20 operating rooms, and 264 beds. These 264 beds will be housed in private rooms; each room is unique in that it can be converted from a standard room to an ICU. This ICU capability for all of the rooms will allow us to expand as necessary for critically ill patients.

Although the hospital will have a neuroscience focus, there will be sufficient beds to backfill the Frankel Cardiovascular Center, which is bursting at the seams. Faculty and staff across the health system worked together with patients and families to assist with the design of the new hospital in order to ensure its patient-centric focus, and to ensure that it meets the many different needs of those it will serve. The state-of-the-art technology provided in this new hospital will include an intra-operative MRI scanner, and a hybrid OR suite, which will allow for endovascular as well as open procedures to be performed. In addition, there will be a specific staging room, which will allow for whole cell therapy to be prepared just outside the operating room. This is an important feature that will enable us to work with a variety of cellular therapies, which are becoming increasingly important in the care of our patients.

CONTINUED ON PAGE 2



## INSIDE THIS ISSUE...

Medical Education News . . . . .	3-11
Faculty News . . . . .	12-14
Alumni News . . . . .	15
Staff News . . . . .	16-18
Department Features . . . . .	19-20

Research News . . . . .	21-22
Michigan Medicine News . . . . .	23-24
Philanthropy News & Impact . . . . .	25-26
Publications & Grants . . . . .	27-31



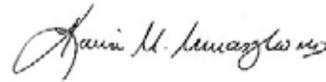
There will also be radiology suites and rehab facilities within the hospital. The overall design will focus on a Michigan-themed effort to bring natural beauty and lighting into the intricacies of a hospital setting. The hospital is seeking to attain LEED Gold status, which represents optimal energy efficiency.

In addition to the exciting news of the new hospital, we have also had many things to celebrate within the Department this year. Highlighted within the pages of this newsletter are some of these exciting accomplishments by our faculty, residents, and staff. Our residents have continued to make significant contributions in literature and research, garnering many notable awards for their efforts. Staff continue to excel in many areas as well, including facilitating and participating in activities and events to benefit the community at large. Diversity, equity, and inclusion efforts within the Department have also been successful this year, garnering University-wide attention. We have received considerable press regarding Kelly Stafford — wife of Detroit Lions quarterback Matthew Stafford — and her successful acoustic surgery by Dr. Greg Thompson and the neuro-otology team here at Michigan. Additionally, we are continuing to work diligently with our development team to help establish a number of new and exciting opportunities for our faculty and residents with respect to brain tumor research and resident wellness.

I would be remiss if I didn't also mention with great sadness the passing of a giant, Dr. Saeed Farhat, a true gentleman and exceptional surgeon who was a beloved member of the U-M Department of Neurosurgery for more than four decades. His legacy will live on within the Department and amongst all those who knew him.

As we approach a new year, we wish each of you health and happiness, and hope that you will be able to visit sometime in the near future. The work that is being carried out at all levels within the Department remains strong, and the future looks bright as we prepare for the opening of the new hospital in 2024, recognizing that this new facility will be our home in the 21st century. The engagement and efforts by faculty and staff in helping plan this hospital were unprecedented, and we truly believe that it will be a hospital for the future, capable of adapting to the changing needs of our patient population. This is an exciting time for Michigan Neurosurgery, and we feel ready for the challenge.

My best to you and your family as we approach the new year,



Karin Muraszko, MD  
Julian T. Hoff Professor and Chair

The new hospital will be located in an area of campus that previously housed the Kresge Laboratories, which were torn down years ago.



# MEDICAL EDUCATION NEWS

## A Word from the Residency Program Director, Dr. Cormac Maher



The resident group at Michigan continues to excel clinically as well as academically. Highlights of some of the group's recent successes are listed in these pages. We especially welcome our four newest department members: PGY-1 residents Jaes Jones, Joey Linzey, and Ayobami Ward, and PGY-2 resident Whitney Muhlestein. With these new residents, it is clear that the great legacy of our training program is in good hands and the future of our specialty is very bright indeed.

We are currently in the midst of application season, and the neurosurgery residency selection process for U-M will be as competitive as ever. This year, we will screen more than 300 applications from US medical school graduates in order to choose the three new residents who will join the Department in 2020. Those of you who follow medical education issues closely will likely be aware that the ACGME has begun to emphasize program efforts to maintain resident wellness. Thanks to the generous donations of many of our graduates and friends, our

department now has the necessary resources to maintain a leadership position with the national implementation of these changes. These initiatives include visiting professor lectures and dinners, travel to courses, as well as support for team-building and networking within the resident group. Michigan has a long history of training the best and brightest individuals in our field. These initiatives and this newly created fund will position the Department well as we continue to attract outstanding individuals in the future.



Finally, I would like to thank Susie Hines for her outstanding work as Program Administrator. This year, Susie received the Graduate Medical Education Program Administrator Excellence Award. This award goes to the best program administrator in the entire medical school – quite an honor and richly deserved. Susie's dedication to the residency program has impacted Michigan Neurosurgery in so many ways. It is great to see that her work has now been recognized outside of the Department as well.



## 2019 Chief Resident Graduation



On Saturday, June 22, Neurosurgery faculty, residents, staff, and family gathered at the U-M Museum of Art for an evening of recognition and celebration honoring graduating residents Drew Wilkinson, MD, Luis Savastano, MD, PhD, and Jacob Joseph, MD.

Since completing their residency training at the University of Michigan, all three have undertaken fellowships at various institutions throughout the country.

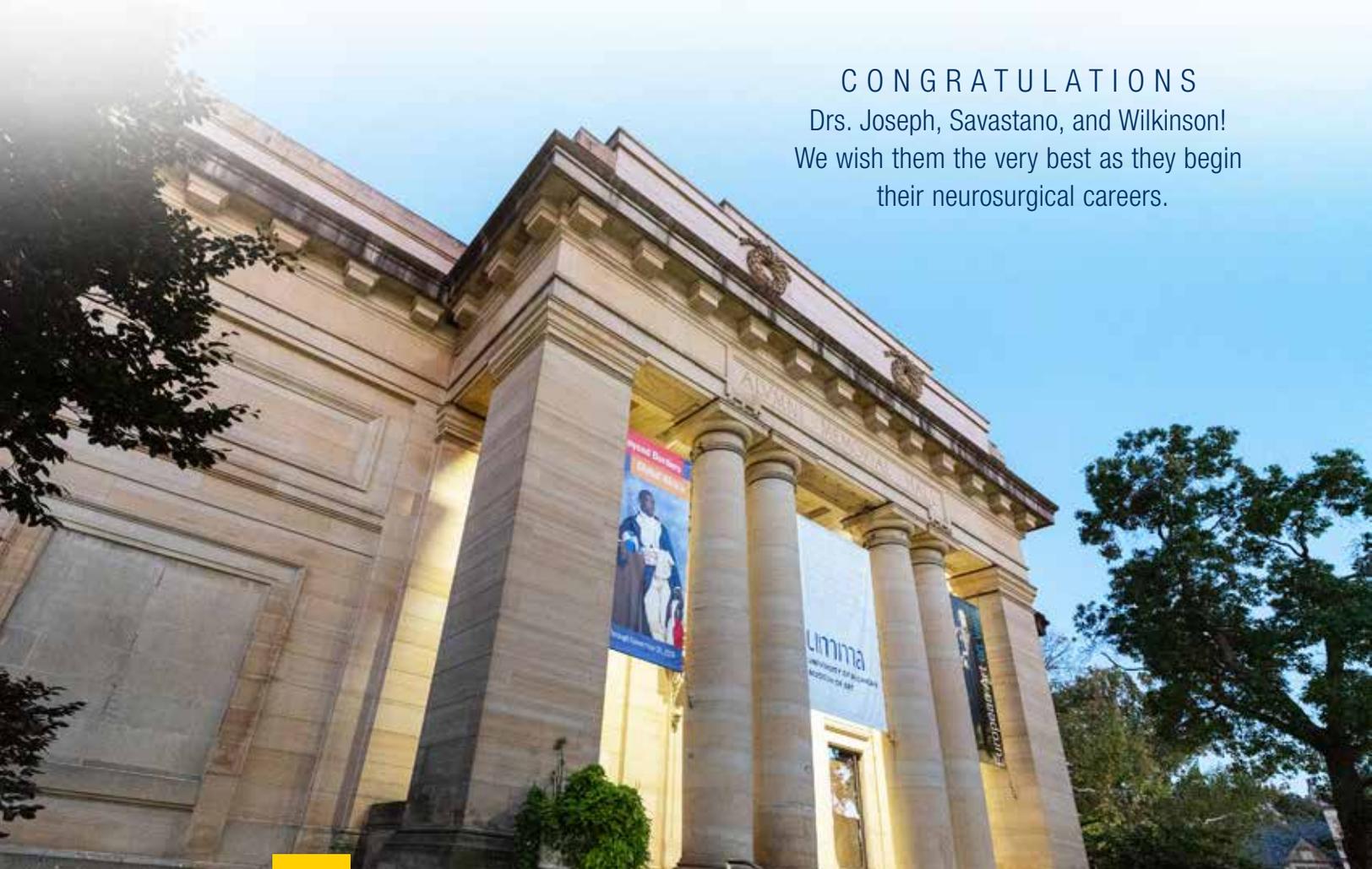
**Dr. Wilkinson** is completing an endovascular fellowship at Barrow Neurological Institute in Phoenix.

**Dr. Savastano** is completing an endovascular fellowship at Beth Israel Deaconess Medical Center in Boston (followed by a faculty appointment as Senior Associate Consultant in Cerebrovascular Neurosurgery at the Mayo Clinic in Rochester, Minnesota).

**Dr. Joseph** is completing a spine fellowship at the University of Pittsburgh.

### CONGRATULATIONS

Drs. Joseph, Savastano, and Wilkinson!  
We wish them the very best as they begin their neurosurgical careers.



# 2019 Medical Education Awards



## Julian T. Hoff Teaching Award

The Julian T. Hoff Teaching Award is given each year to a junior faculty member within the Department with an exemplary record in teaching our residents.

**2019 Recipient:** Nicholas Szerlip, MD



## Max Peet Resident Teaching Award

The Max Peet Teaching Award is given annually to a resident who has distinguished him/herself in the arena of teaching other residents and medical students.

**2019 Recipient:** Luis Savastano, MD, PhD



## Friend of Neurosurgery Award

The Friend of Neurosurgery Teaching Award is given each year to an individual(s) outside of the Department who is instrumental in teaching our neurosurgical residents.

**2019 Recipients:** Mott MR OR Techs: Samuel Elkins, ARRT (R)(MR); Robert F. Ladouceur, BS, ASRT (R)(CT)(MR); David J. Nagy, BS, RT (R)(CT)(MR); and Dragan Spremo, (R)(CT)(MR) (not pictured)

## McGillicuddy Resident Leadership Award

The McGillicuddy Resident Leadership Award recognizes a resident who exhibits exemplary leadership in maintaining the highest standards of professionalism.

**2019 Recipient:** Jacob Joseph, MD



# 2019 Neurosurgical Residents

This year, we welcomed four new residents to our training program at the beginning of July: Drs. Jaes Jones, Joseph Linzey, and Ayobami Ward (PGY-1s) and Dr. Whitney Muhlestein, who joined our program as a PGY-2 resident.



## Jaes Jones, MD, MS

**Medical School:** Cleveland Clinic Lerner College of Medicine of Case Western Reserve University  
**Graduate School:** Case Western Reserve University  
**Undergraduate:** Massachusetts Institute of Technology  
**Hometown:** Sandy, Utah

**Why Neurosurgery?** It is the perfect intersection of my love for people, neuroscience, engineering, and working with my hands.

**Hobbies/Interests:** Wrestling, trail running, rock climbing, my wife, Hillary, and three sons (Bryson (3.5 yrs.), Pierce (21 mo.), and Vander (21 mo.)), and faith (The Church of Jesus Christ of Latter-Day Saints)

**Clinical Interests:** Epilepsy surgery, neuromodulation, spine, device development



## Joseph Linzey, MD, MS

**Medical School:** University of Michigan Medical School  
**Graduate School:** University of Michigan School of Public Health  
**Undergraduate:** Brigham Young University  
**Hometown:** Groton, Massachusetts

**Why Neurosurgery?** As an undergraduate, I fell in love with neuroscience and anatomy. During one of my first months in medical school, Dr. Pandey and TJ Wilson let me scrub into a lumbar laminectomy case. They let me make first incision and tie some of the closing stitches. At that point I was hooked. By September of my M1 year I was working on research with Dr. Pandey and never looked back. Ultimately, I decided on neurosurgery because I was fascinated by the pathologies and patient population and because I felt like I had "found my people" in medicine.

**Hobbies/Interests:** Spending time with family (wife, two kids), exercising, hiking, finding new places to eat, reading

**Clinical Interests:** Neuro-oncology, skull base, cerebrovascular



## Ayobami Ward, MD, ScM

**Medical School:** The Medical College of Georgia  
**Graduate School:** Johns Hopkins Bloomberg School of Public Health  
**Undergraduate:** Johns Hopkins University  
**Hometown:** Kennewick, WA

**Why Neurosurgery?** As a sophomore in college, I had a chance encounter with a neurosurgeon in order to complete a research requirement for my degree in neuroscience. At that point in my life, I had never considered medicine, let alone neurosurgery. At the time I was a budding scientist and engineer. Neurosurgery was an amalgamation of these two interests – with a spirit of innovation and imagination that I found endlessly fascinating. When I decided to change paths and enter medical school, there was no option for me other than neurosurgery.

**Hobbies/Interests:** Cars, cooking, tennis, travel

**Clinical Interests:** Spine oncology, TBI, global health



## Whitney Muhlestein, MD (entered program as a PGY-2)

**Medical school:** Vanderbilt University School of Medicine  
**Undergraduate:** Harvard University  
**Hometown:** South Pasadena, California

**Why Neurosurgery?** I loved all things neuro in medical school, and so I gave every neuro-focused specialty a try – neuroradiology, neurology, and neurosurgery. I liked them all, but what I loved about neurosurgery was the opportunity to be a radiologist, a neurologist, and a surgeon for neurologically ill patients. I love that as the neurosurgeon, the buck stops with you.

**Hobbies/Interests:** Choral singing, Russian, violin, watching college football, playing with my son

**Clinical Interests:** Oncology, using machine learning and big data to improve predictive modeling

# 2019 Neurosurgical Fellows

Additionally, the Department welcomed two new fellows at the beginning of July: Drs. Lauren Ottenhoff and Kevin Swong. Dr. Ottenhoff will be completing a two-year neurocritical care fellowship and Dr. Swong will be completing a one-year spine fellowship.



## Lauren Ottenhoff, DO

**Residency Training:** Loyola University Medical Center

**Medical School:** Midwestern University: College of Osteopathic Medicine

**Undergraduate:** Northern Michigan University



## Kevin Swong, MD

**Residency Training:** Loyola University Medical Center

**Medical School:** Southern Illinois School of Medicine

**Undergraduate:** Brown University

# 6th Annual U-M Resident Research Symposium

The 6th Annual Neurosurgery Resident Research Symposium took place on May 10 this year. Dr. Robert Harbaugh, Distinguished Professor and Chair, Department of Neurosurgery, Penn State Hershey Medical Center, served as the honored guest speaker as well as the 2019 Elizabeth Crosby Visiting Professor.

As it does each year, the event provided a great opportunity for our residents to present their original work, as well as a chance to learn from a nationally distinguished colleague. Drs. Todd Hollon and Luis Savastano were chosen as co-winners of the Crosby Basic Science Research Award for having the best basic science presentations, and Dr. Siri Khalsa was the recipient of the Chandler Clinical Research Award, which is awarded for the best clinical research presentation. The 2020 Neurosurgery Residency Research Symposium will take place on May 1, 2020. Dr. Susan Chang of the University of California, San Francisco will serve as our honored guest as well as the Elizabeth Crosby Visiting Professor.



Left to right: Dr. Cormac Maher, Dr. Todd Hollon, honored guest speaker Dr. Robert Harbaugh, Dr. Siri Khalsa, and Dr. Luis Savastano



# 16th Annual Neurosurgery Charity Softball Tournament in New York City

The 16th Annual Neurosurgery Charity Softball Tournament took place in NYC's Central Park on June 8 this year. A total of 40 teams competed in the tournament, which benefits the Neurosurgery Research and Education Foundation (NREF). More than \$125,000 were raised for NREF neuro-oncology research fellowships.

The U-M Department of Neurosurgery's 2019 team included several faculty members – Drs. Buckingham, Szerlip, Oppenlander, and Kashlan – as well as our former spine fellow, Dr. Elswick, and our neurocritical care fellow, Dr. Ahmad. Seven residents also competed: Jacob Joseph; Todd Hollon; Brandon Smith; Yamaan Saadeh; Tim Yee; Katherin Holste; and Sara Saleh.

The team had their most successful year to date in the tournament, making it to the playoffs and finishing as one of the top 16 teams of 40! In the end, Barrow Neurological Institute defeated UCSF in the championship game and won the tournament, now boasting seven of the last 10 championships. Congrats to all the participating teams, especially our own U-M team!



## Chief Resident Brandon Smith shares a recap of this year's exciting tournament:

The softball trip continues to be a treasured part of our program, and this year was by far our most successful. It all started back home this spring when we organized indoor and outdoor practices, scrimmages with the NICU staff, and engineered the lineup/strategy, which surely contributed to our success. Our first game was against Duke, a perennial powerhouse with hired coaching... despite the odds, and in scrappy underdog fashion, we took home the W with a lock-down defense stranding three of their players on base at the end of the game. We then took on UVA after a four-game pause. At one point we trailed by four runs. However, a strong four-run rally late in the game resulted in a tie. We secured our place in the playoffs when we upended Rutgers with big bats and diving catches. We finally fell to Florida by a single run in the playoffs despite strong batting and great defense. Overall we had an awesome trip with tons of memories. It continues to be an amazing team building experience with residents and faculty playing side-by-side.



# Resident Honors & Awards

Our residents continue to receive myriad prestigious awards and honors for their academic, clinical, and leadership work; 2019 was no exception. Recent notable achievements include but are not limited to those listed below.



## David Altshuler, MD

- Resident Ombudsman, U-M Department of Neurosurgery, July 2016 – present



## Jay Nathan, MD

- University of Michigan Healthcare Administration Scholars Program, 2017 – 2019



## Amy Bruzek, MD

- American Association of Neurological Surgeons/ Congress of Neurological Surgeons Pediatric Section Basic Science Best Poster Award, December 2018
- Family Feud Neuroanatomy Award – Junior Resident, U-M Department of Neurosurgery, June 2019



## Yamaan Saadeh, MD

- Elected to AANS Young Neurosurgeons Committee, 2018



## Todd Hollon, MD

- American Association of Neurological Surgeons Technology Development Grant (4/1/2018 – 4/1/2019)
- Crosby Basic Science Research Award, Neurosurgery Resident Research Symposium, U-M Department of Neurosurgery, May 2019
- Family Feud Neuroanatomy Award –Senior Resident, U-M Department of Neurosurgery, June 2019



## Luis Savastano, MD, PhD

- Crosby Basic Science Research Award, Neurosurgery Resident Research Symposium, U-M Department of Neurosurgery, May 2019
- Max Peet Teaching Award, U-M Department of Neurosurgery, June 2019



## Jacob Joseph, MD

- John E. McGillicuddy Resident Leadership Award, U-M Department of Neurosurgery, 2019



## Brandon Smith, MD

- Resident Ombudsman, U-M Department of Neurosurgery, July 2018 – June 2019



## Siri Khalsa, MD

- American Association of Neurological Surgeons Donald O. Quest Resident Clinical Science Award, 2019
- Best Neurosurgery Poster Presentation, U-M Neuroscience Day, Departments of Neurology and Neurosurgery, University of Michigan, June 2019
- Chandler Clinical Research Award, Neurosurgery Resident Research Symposium, U-M Department of Neurosurgery, May 2019



## Matt Willsey, MD

- Best Platform Presentation, U-M Neuroscience Day, Departments of Neurology and Neurosurgery, University of Michigan, May 2019



## Joseph Linzey, MD

- U-M Medical School Dean's Award for Research Excellence, May 2019
- Edgar A. Kahn Award for Excellence in Neurosurgery, May 2019



## Tim Yee, MD

- Junior Resident Champion, Neuroanatomy Competition 2018, U-M Department of Neurosurgery
- Resident Ombudsman, U-M Department of Neurosurgery, July 2019 – present

# Resident Oral Presentations at National Meetings

**July 1, 2018 – June 30, 2019** Our resident trainees continue to be productive with respect to their research and scholarly activities. During the 2018-2019 academic year, the resident cadre has given an impressive 22 talks at national meetings throughout the country, as well as one international talk in India.

**2018 AANS/CNS Section on Neurotrauma and Critical Care Annual Meeting** Toronto, ON. **Yamaan Saadeh, MD:** Malpractice claims concerning traumatic spinal cord injury

**2018 Society for Minimally Invasive Spine Surgery Annual Forum** Las Vegas, NV. **Yamaan Saadeh, MD:** Comparison of segmental lordosis and global spinopelvic alignment after single-level lateral lumbar interbody fusion or transforaminal lateral interbody fusion

**2018 Congress of Neurological Surgeons Annual Meeting** Houston, TX. **David Altshuler, MD:** BDNF, COMT, and DRD2 polymorphisms and ability to return to work in adult patients with low and high-grade glioma. **Jacob Joseph, MD:** Pupillary changes after nonconcussive high-acceleration head impacts on high school football athletes. **Yamaan Saadeh, MD:** Relationship of psoas muscle volume to survival in operative metastatic spine tumor patients. **Brandon Smith, MD:** The correlation of ODI and the 4-question scales for pain and physical function from PROMIS. **Drew Wilkinson, MD:** Increased rate of subarachnoid hemorrhage in polycystic kidney disease despite screening. **Matt Willsey, MD:** Seizure-free outcome after corpus callosotomy using laser interstitial therapy in a pediatric patient

**2018 Tumor Section Satellite Symposium/CNS Annual Meeting** Houston, TX. **Todd Hollon, MD:** Rapid intraoperative differentiation of pseudoprogression and glioma recurrence using stimulated Raman histology

**2018 American College of Surgeons Clinical Congress** Boston, MA. **Jay Nathan, MD:** Persistent opioid prescribing in adult patients with spinal deformity undergoing operative or non-operative treatment

**2018 American Academy of Neurological Surgeons Annual Meeting** Palm Beach, FL. **Luis Savastano, MD, PhD:** Imaging structural and biological markers of carotid plaque vulnerability with new high-resolution multimodal platform: laser angiography

**2018 Society for Neuro-Oncology Annual Meeting** New Orleans, LA. **Todd Hollon, MD:** Multicenter, prospective validation of automated intraoperative neuropathology using stimulated Raman histology and convolutional neural networks

**2018 AANS/CNS Section on Pediatric Neurological Surgery Annual Meeting** Nashville, TN. **Amy Bruzek, MD:** 1) Normal morphometric changes at the craniocervical junction; 2) CSF circulating tumor DNA copy number quantifies tumor growth and In Vitro treatment response in pediatric DIPG and high grade glioma

**2018 AASAN NSI Annual Meeting** Jaipur, India. **Yamaan Saadeh, MD:** Relationship of psoas muscle volume to survival in operative metastatic spine tumor patients

**2019 International Stroke Conference** Honolulu, HI. **Luis Savastano, MD, PhD:** Laser angiography in carotid artery disease: imaging findings and histopathological correlation

**2019 North American Skull Base Society Annual Meeting** Orlando, FL. **Todd Hollon, MD:** Rapid intraoperative diagnosis of sellar region tumors using stimulated Raman histology

**2019 Spine Summit: AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting** Miami, CA. **Siri Khalsa, MD:** Volumetric analysis of endoscopic decompression for lumbar spinal stenosis. **Jay Nathan, MD:** Operative correction of adult spinal deformity is not associated with reduced risk of persistent opioid prescribing

**2019 7th Intraoperative Imaging Society Meeting** Houston, TX. **Todd Hollon, MD:** Fluorescence guided surgery and optical imaging techniques

**2019 American Association of Neurological Surgeons Annual Meeting** San Diego, CA. **David Altshuler, MD:** Decreased function of isoprenylcysteine carboxylmethyltransferase function results in increased sensitivity of chemoradiation session. **Siri Khalsa, MD:** 3D ventricular volume analysis to detect shunt failure. **Yamaan Saadeh, MD:** Pre-operative and post-operative opioid use in instrumented versus non-instrumented spine surgery

## 2019 Visiting Professors

Each year, the Department of Neurosurgery invites renowned guest speakers and lecturers to present on various, relevant neurosurgery-specific topics. These visiting lectureships are named in honor of six U-M neurosurgeons and physicians who have helped to shape the practice of neurosurgery at the University of Michigan and beyond.

### Elizabeth Crosby Visiting Professor

**Robert Harbaugh, MD, FAANS, FACS, FAHA,** Senior Vice President, Penn State Academic Medical Group; Distinguished Professor and Chair, Department of Neurosurgery, Penn State Hershey Medical Center  
**Title:** The future of neurosurgical education

### Saeed M. Farhat Visiting Professor

**Alex B. Valadka, MD, FANS, FACS,** Professor and Chair, Department of Neurosurgery, Virginia Commonwealth University School of Medicine; Director, American Board of Neurological Surgery; President-Elect, American Association of Neurological Surgeons. **Titles:** 1) TBI management and the VCU legacy. 2) Major League Baseball's approach to concussion

### Julian T. Hoff Visiting Professor

**E. Antonio Chiocca, MD, PhD,** Chairman of the Department of Neurosurgery, Brigham and Women's Hospital; Harvey W. Cushing Professor of Neurosurgery, Harvard Medical School. **Title:** Gene and oncolytic virus clinical trials for GBM

### Edgar A. Kahn Visiting Professor

**Dean Chou, MD,** Professor, Department of Neurosurgery, University of California, San Francisco. **Title:** Treatment strategies for adult scoliosis: Does everybody need T10 to the pelvis?

### James Taren Visiting Professor

**Kendall H. Lee, MD, PhD,** Enterprise Chair of Research, Professor of Neurosurgery and Physiology, The Mayo Clinic. **Title:** Neural-engineering implantable technologies for neuro-psychiatric disorders in neurosurgery

### Joan Venes Visiting Professor

**Ian F. Pollack, MD, FACS, FAAP,** Chief, Pediatric Neurosurgery, Children's Hospital of Pittsburgh, Vice-Chairman for Academic Affairs, Department of Neurological Surgery, University of Pittsburgh School of Medicine. **Titles:** 1) The evolving role of surgery and molecular profiling in childhood brain tumors. 2) Immunotherapy for childhood gliomas

# U-M Neurosurgery Becomes First Program to Utilize “SIMPL” App to Evaluate and Facilitate Resident Procedural Learning in Neurosurgical Residents



At the beginning of 2019, the U-M Department of Neurosurgery became the first national neurosurgery program to join the Procedural Learning and Safety Collaborative (PLSC) – a non-profit research consortium with a mission “to improve the quality of surgical care by improving the quality of surgeons.” PLSC focuses on investigating and developing tools, curriculum, and policy to improve surgical training. Through

joining the PLSC, the Department also became the first neurosurgery program to utilize the PLSC’s “SIMPL” (System for Improving and Measuring Procedural Learning) app – a smartphone-based evaluation system that enables faculty to evaluate residents in the OR in real time, thus providing residents with immediate operative feedback after every procedure they perform. Dr. Nick Szerlip, Clinical Associate Professor of Neurosurgery, is spearheading this educational initiative within the Department and is recruiting other neurosurgical sites in order to begin a national neurosurgical trial of the SIMPL app.

## Background: The Need

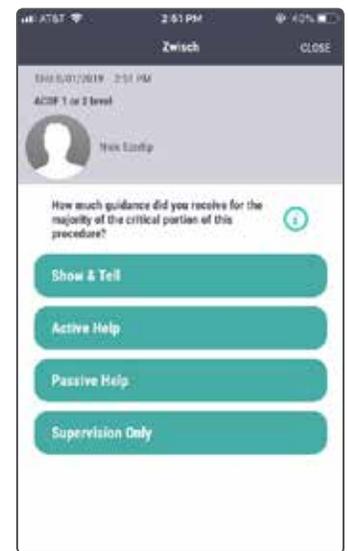
Individualized feedback in the medical education setting allows trainees to recognize their current level of performance and make necessary adjustments for improvement. However, many surgical trainees express that feedback is not always received in an effective or timely manner. Time and cost constraints, as well as competing clinical demands, shortened work hours for residents, and new accreditation requirements all pose unique challenges to an optimally effective training feedback loop. As a result, there has been increasing concern that surgical residents are not prepared for independent practice. Additionally, there is no current standardized system for faculty to formally assess or track a trainee’s ability to independently and competently complete routine neurosurgical procedures. And, though there are case logging requirements set forth by the Accreditation Council for Graduate Medical Education (ACGME), there is no consensus as to the number of times an average resident needs to perform a given procedure in order to achieve competence and independence.

## A Possible Solution: SIMPL

SIMPL aims to provide a means to overcome the hurdles that impede effective and timely evaluative feedback for residents. It is a two-way tool that addresses the questions of resident performance, operative autonomy, and case complexity in a feasible and user friendly manner. It has been evaluated in General Surgery training programs and has withstood tests of feasibility, reliability, and validity.

## How It Works

An evaluation within SIMPL can be initiated by either faculty or resident. Raters are asked to record ratings for three scales: autonomy (Zwisch level), performance, and relative patient-specific complexity. Faculty also have the option to record dictated feedback regarding the resident’s performance in a given case, which can be played back at any time by the resident. Additionally, the app is linked to the ACGME case-logging system, allowing residents to fill out an evaluation and log the case with the ACGME concurrently.



## Initial Findings at Michigan Medicine

In the first six months following the implementation of the SIMPL app within our Department, excellent resident and faculty participation led to a greater than 80% response rate to evaluations from both groups. Of those who logged into the application during this timeframe (21 residents and 18 faculty), at least 70% of both groups completed at least one evaluation. Additionally, of all the evaluations completed by faculty, 60% included dictated feedback, which residents unanimously agreed was the most helpful portion of the evaluation process.

## Long-Term Possibilities: Site Recruitment

In addition to providing invaluable feedback for individual residents, the SIMPL app provides a platform to collect aggregate data that could help shape the future of neurosurgical education. Through the app, data accumulated from one institution can easily be combined with the data of others, allowing more generalizable conclusions to be drawn. Such aggregate data could help address overarching educational questions, such as the adequacy of case requirement minimums. It could also assist in the creation of standardized learning curves, which would allow residency programs to identify residents who would benefit from personalized alterations to the curriculum. Ultimately, data gained from the use of this application has the potential to foster important neurosurgical education research and programmatic improvement nationally.

Dr. Szerlip is actively inviting other neurosurgical programs to participate in a national trial of the SIMPL app. Interested sites should reach out to [nszerlip@umich.edu](mailto:nszerlip@umich.edu) for additional information.

# FACULTY NEWS



## Dr. Muraszko Becomes President of the SNS

U-M Neurosurgery Chair, Dr. Karin Muraszko, was elected president of the Society of Neurological Surgeons (SNS) – the oldest neurosurgical society in the world. She is the first-ever female president and is presiding over the Society in its seminal 100th year of existence. Her term began in May, 2019 when she received the presidential gavel at the SNS Annual Meeting in Seattle, and it will conclude at the 2020 Annual Meeting in Philadelphia where she will deliver the presidential address.

Dr. Muraszko is also a member of the ACGME's Neurosurgical Residency Review Committee (RRC) and was selected as a member of the RRC's Executive Committee. She continues to serve on the Executive Committee of Women in Neurosurgery, and was recently elected Vice Chair of the UMHS Hospital Executive Board. She was also selected as Chair of the U-M Children & Women's Executive Committee.

## Welcome New Faculty Member, Dr. Wajd Al-Holou



Dr. Wajd Al-Holou joined the U-M Neurosurgery faculty as Clinical Assistant Professor in October. Dr. Al-Holou is an alumnus of both the University of Michigan Medical School as well our Neurosurgery Residency Program. He completed his residency in 2016, after which he completed a Complex Neurosurgical Oncology Fellowship at MD Anderson Cancer Center in Houston. His training focused on the management of complex brain tumors, spinal tumors, and skull base malignancies. After completing his fellowship in 2017, Dr. Al-Holou was appointed Assistant Professor in the Department of Neurosurgery at Wayne State University School of Medicine. While at Wayne State, he also served as the Director of the Multi-Disciplinary Neuro-Oncology Team at Karmanos Cancer Institute.

Dr. Al-Holou specializes in the management of complex brain tumors, primarily focusing on gliomas and metastases to the brain, and has expertise in the use of advanced awake mapping techniques, microsurgery, and image-guidance to maximize tumor removal in the safest possible manner. He also specializes in the management of meningiomas and spinal tumors. His research interest focuses primarily on understanding the genetic mechanisms of recurrence in glioblastoma, and in identifying genomic and radiographic biomarkers for treatment resistance in GBM.

## 2019 Promotions Effective Sept. 1, 2019



**Martin Buckingham, MD,** was promoted to Clinical Assistant Professor, Department of Neurosurgery.



**Laurel Moore, MD,** was promoted to Clinical Professor in the Departments of Anesthesiology and Neurosurgery.



**Venkatakrisna Rajajee, MBBS,** was promoted to Clinical Professor in the Departments of Neurosurgery and Neurology.

# Faculty Awards & Accomplishments

**Maria Castro, PhD**, R.C. Schneider Collegiate Professor of Neurosurgery, received the inaugural Rogel Faculty Scholar Program Award. She was also awarded a grant from the NIH-NINDS, entitled, *Immune-mediated therapies in a genetically engineered murine model of diffuse intrinsic pontine glioma*. She received funding from the Pediatric Brain Tumor Foundation and Samson Research Fund for research into pediatric high-grade gliomas, and from the ChadTough Foundation and Smiles for Sophie Forever Foundation, through the U-M Pediatric Brain Tumor Initiative, for research into novel immunotherapies for diffuse intrinsic pontine glioma. She was elected to the rank of American Association for the Advancement of Science (AAAS) Fellow in 2019.

**Teresa Jacobs, MD**, Professor of Neurosurgery, was appointed to a 29-month term on the national board of the Association of Physician Leadership in Care Management (APLCM) in November. She is among seven board members who oversee the physician section of the American Case Management Association (ACMA), a 9000-member organization of physicians, physician advisors, care managers, and social workers striving to advance the quality of services for patients throughout the continuum of care.

**Pedro Lowenstein, MD, PhD**, Richard Schneider Collegiate Professor of Neurosurgery, is a Principal Investigator on awards from the Pediatric Brain Tumor Foundation and Samson Research Fund and an award from the ChadTough Foundation and Smiles for Sophie Forever Foundation through the U-M Pediatric Brain Tumor Initiative. The funding will support research into DIPG and pediatric high-grade gliomas, respectively. He was also awarded a grant from The WhatIFF Foundation for the treatment of childhood brain cancer to develop novel therapies for pediatric hemispheric high grade gliomas. He was the PI on a clinical trial "Combined Cytotoxic and Immune-Stimulatory Therapy for Glioma" (<https://clinicaltrials.gov/ct2/show/NCT01811992>). Though not yet mature, trial results to date support the expansion of this therapy to larger phase clinical trials and their use in the pediatric setting.

**Cormac Maher, MD**, Professor of Neurosurgery and Residency Program Director, attended the ACGME Program Director Competency Summit as the Neurosurgery Specialty Representative in December, 2018. In 2019, he served as the Gallo Visiting Professor at Oregon Health & Science University, the Michael Scott Visiting Professor at the Brigham and Women's Hospital and the Mayo Medical Education Visiting Professor at the Mayo Clinic. He was invited to serve as honored guest for the Georgia Neurosurgical Society as well as the Neurosurgical Society of Australia. Dr. Maher was a Guest Examiner for oral board certification for the American Board of Neurological Surgery in May. He is serving as the Chair of the Accreditation Council for Pediatric Neurosurgery Fellowships as well as the Neurosurgery Representative to the Organization of Program Director Associations (since 2018). He is currently the pediatric member for the Committee for Advanced Subspecialty Training and this year began a six-year term as Neurosurgery Representative to the ACGME Program Director Quality and Safety Council.

**Parag Patil, MD, PhD**, Associate Professor of Neurosurgery, was elected to the Executive Committee of the AANS/CNS Section on Pain. He is the current Co-Chair of the Neural Interface Conference Steering Committee, which works to advance and translate neural interface technology for human applications. Dr. Patil and his research team in the Center for Restorative Neuroengineering were recently awarded a \$2.3 million NSF grant to develop novel upper-extremity neuroprosthetic devices.

**Venkatakrishna Rajajee, MBBS**, Professor of Neurosurgery, was appointed chair-elect of the Neurocritical Care Society's Guidelines Committee in August, 2019. He also received Top Reviewer recognition from the journal *Neurocritical Care* in September.

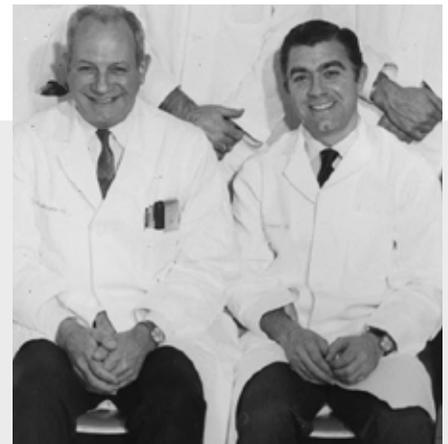
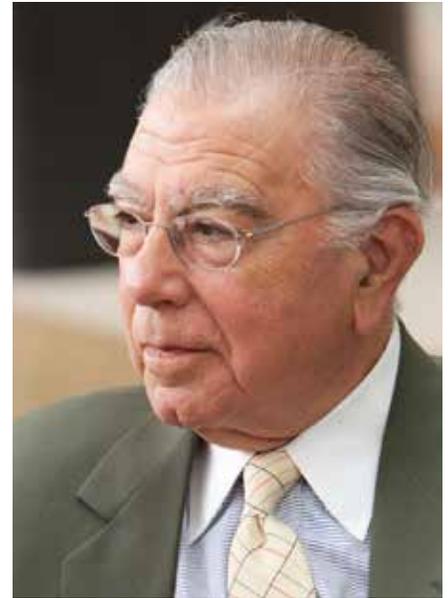
**Kyle Sheehan, MD**, Assistant Professor of Neurosurgery, was appointed as the neuro-specialist on the Gift of Life Michigan Advisory Board, the state-wide organ procurement organization. The board provides guidance of the organization's clinical practice and ensures compliance with Centers for Medicare/Medicaid Services regulations.



# IN MEMORIAM: Dr. Saeed “Sid” Farhat 1928-2019

The U-M Department of Neurosurgery lost a long-time and beloved pillar in September when Dr. Saeed “Sid” Farhat passed away at the age of 91.

Dr. Farhat was a true gentleman and consummate surgeon, well known throughout the Department for his kindness, vast neurosurgical knowledge, and dapper style. He attended Utah State for his undergraduate studies and received his medical degree in 1955 from the University of Nebraska. He did a General Surgery residency at University of Nebraska receiving Board certification in 1961. He then went on to Neurosurgery training at the University of Michigan. He had a distinguished career at St. Joseph Mercy Hospital in Ypsilanti where he was Chief of Neurosurgery for 34 years. After retiring from St. Joe's, he returned to the University of Michigan in 1998, where he continued to provide guidance and advice as an Emeritus Professor of Neurosurgery. Generations of neurosurgeons received wisdom and support from Dr. Farhat. He was honored with a named lectureship which will continue to honor his admonition that neurosurgeons be involved in the world and their communities. The weekly neurovascular conference was also named in his honor, in recognition of his dedication to his patients and the specialty.



Dr. Farhat exemplified a life of service, led with elegance and kindness. We offer our deepest sympathies to his wife of 63 years, Dorothy, and his daughters and their families, and we thank them for sharing this wonderful man with us for so many years.

*Below are a few words of tribute from Dr. Farhat's colleagues and friends at Michigan Medicine and beyond.*

**Dr. John McGillicuddy, Professor Emeritus of Neurosurgery** This is a great loss to our Michigan Neurosurgery program. Dr. Farhat was one of the pillars of the reconstituted Michigan program under Dr. Richard Schneider. When I arrived here in 1970, Dr. Farhat was in solo private practice at St. Joseph Mercy and first-year residents spent 4-6 months with him. It was an intense, one-on-one experience with a mentor of exceptional clinical judgement and superb surgical skill. Double boarded in both General Surgery and Neurosurgery, Dr. Farhat could open a chest and take out a paraspinous tumor with no difficulty. I still remember many things that he taught, especially his intense interest in patient care. He gave us a great deal of responsibility but was immediately available for help. I believe that all of us who worked with Dr. Farhat in those years strived to "be like Sid." After he retired from St. Joe's and came to work at the U, he saw many patients in our clinics and contributed his knowledge and experience in our conferences. Dr. Farhat had a reserved, dignified bearing but was also a warm, helpful man with a sly sense of humor. It was always a pleasure to talk with him about neurosurgery, but also about Michigan football, art, photography and many other subjects. I will miss him. He is the last of my teachers and role models.

**Dr. Bill Chandler, Professor Emeritus of Neurosurgery** My mentor, my friend and one of my heroes. Sid was a remarkably capable and kind person. We will all miss him so much.

**Dr. Greg Thompson, John E. McGillicuddy Professor of Neurosurgery** Dr. Farhat was an exemplary physician and a gentleman of unflinching kindness. What a privilege it has been to know him and to see such a model of immaculate professional and personal comportment. His legacy will live on amongst all who were fortunate to know him.

**Dr. Carol Bradford, Executive Vice Dean for Academic Affairs, U-M Medical School; Chief Academic Office, Michigan Medicine** Dr. Farhat will be missed but never forgotten. I first met him as an intern at St. Joe's. He would arrive in a three-piece suit in the middle of the night on call for an emergency. A true gentleman and professional.

**U-M Neurosurgery Alumnus Dr. Steven Swanson (1985)** Sid was my mentor, teacher, friend, colleague, and confidant for almost 40 years. He advised me on many of my life and career decisions... I will miss him terribly.

**U-M Neurosurgery Alumnus Dr. Nathan Selden (1999)** Dr. Farhat was an exceptional individual of great vision, ethics, determination, and talent. He influenced us all for the better.

# ALUMNI NEWS

## Alumni News & Notes



**Tony Asher, MD, (1995)** was named President of the Neuroscience Institute, Atrium Health, and elected Treasurer of the American Association of Neurological Surgeons (AANS) in 2019. He was also named Co-Chairman of the American Spine Registry, which is a joint AANS-AAOS (American Association of Orthopaedic Surgeons) National Spine Registry Program that is particularly notable for representing an unprecedented collaboration between two large surgical societies. Dr. Asher led the development of, and helped launch, the Practice and Outcomes of Surgical Therapies (POST) project for the American Board of Neurological Surgery (ABNS). He finished his six-year tenure on the ABNS last spring and served his final year as Vice Chairman of the ABNS. He also stepped down as Program Director of the Neurological Surgery Residency Program at Carolinas Medical Center after being in the position for the past seven years. During this time, Dr. Asher initiated and grew the program to its mature state; the first resident will be graduating from the program in the next academic year.



**Robert Dempsey, MD, (1983)** Manucher J. Javid Professor and Chairman of Neurological Surgery, University of Wisconsin School of Medicine and Public Health, was selected to honor Dr. Richard Schneider, former Chair of Michigan Neurosurgery, by delivering the Schneider Lecture at the American Association of Neurological Surgeons meeting. Dr. Dempsey's lecture stressed how we stand on the shoulders of those who came before us by using the science of our time to improve the patient directed care we deliver in neurosurgery.



**John Feldenzer, MD, (1989)** retired from active neurosurgical practice in December, 2018 with the exception of a clinic at the Salem, Virginia Veterans Medical Center. He remains an avid fly fisherman and gave a talk at the 25th Annual Rodmakers Gathering at the Catskill Fly Fishing Center and Museum in New York in September, 2019. His topic was George H. Halstead: Tribute to a Classic Bamboo Rodmaker, which followed up his publication on the same topic, published in *The American Fly Fisher* (Volume 34, No. 1) in 2008.



**Judy Gorelick, MD, (2001)** joined the faculty at the Frank H. Netter MD School of Medicine at Quinnipiac University in June, 2019, as an Assistant Professor of Neurosurgery, Department of Surgery.



**Elyne Kahn, MD, MPH, (2018)** completed a spine surgery fellowship at the Cleveland Clinic and is now practicing at the Michigan Brain & Spine Institute at St. Joseph Mercy Hospital in Ann Arbor.



**James Markert, MD, (1995)** James Garber Galbraith Endowed Chair of Neurosurgery, University of Alabama at Birmingham, was elected Secretary of the American Academy of Neurological Surgery for the term of 2018-2019.



**Nathan Selden, MD, PhD, (1999)** Campagna Professor and Chair, Department of Neurological Surgery, Oregon Health & Science University, published "The Rhetoric of Medicine: Lessons on Professionalism from Ancient Greece" (Oxford University Press) with Nigel Nicholson, PhD, Dean of the Faculty at Reed College. Dr. Selden was also elected as a Director of the American Board of Neurological Surgery in May, 2019 and, in July, became Chair of the Oregon Health & Science University Professional Board (Medical Executive Committee).



**William Stetler, MD, (2015)** began practicing at Carolina Neurosurgery and Spine Associates in Charlotte, North Carolina in October, 2019.



**Jennifer Strahle, MD, (2015)** Assistant Professor of Neurosurgery, Orthopedic Surgery and Pediatrics, Washington University in St. Louis, St. Louis Children's Hospital, passed the oral board certification exam in May, 2019, and thus is now a certified Diplomate of the American Board of Neurological Surgery.



**Khoi Than, MD, (2014)** was appointed Associate Professor of Neurosurgery and Orthopaedic Surgery at Duke University in August, 2019.

# Welcome to U-M Neurosurgery!

Get know to our newest staff members, who joined the Department in 2019.



**Kristina Cooper, Medical Assistant**

Kristina joined the Adult Clinic staff as a Medical Assistant in February. She started at Michigan Medicine in November of 2018 as an extern in the Pediatric Neuro Plastic Surgery Clinic at Mott, where she learned about Neurosurgery and fell in love with the specialty. She spends her time outside of work with her son and is an avid sports fan.



**Jill Russel, RN, Spine Nurse**

Jill joined the Adult Clinic staff as the spine nurse in May. Previously, she served as the Nurse Educator on the inpatient unit 4A. She has brought a wealth of knowledge to our spine patients from her inpatient experience, as well as her 25 years of service at Michigan Medicine. Jill and her husband have a lake home in northern Michigan where they enjoy spending time outdoors with family and friends.



**Vanessa David, Executive Assistant**

Vanessa joined the Department in May as Executive Assistant to the Chair and Chief Department Administrator (CDA). She has been at Michigan Medicine for more than eight years with progressive experience in administrative support. Immediately prior to joining the Department, Vanessa supported the CDA of the Department of Physical Medicine and Rehabilitation. She holds an associate degree in Business Administration and enjoys spending time with her family and camping.



**Reagan Spindler, Patient Services Intermediate**

Reagan joined the Department in November and provides administrative support to Drs. Heth and Sagher. She came to Michigan Medicine from Henry Ford West Bloomfield and holds a bachelor's degree in Biology and Psychology from Hope College. Outside of work, she enjoys reading and spending time with her family, friends, and French bull dog, Beau.



**Tammy Pomorski, Medical Assistant**

Tammy joined the Adult Clinic as a Medical Assistant in July. She has been at Michigan Medicine since 2011. Immediately prior to joining the Department, Tammy worked as an MA in Orthotics and Prosthetics. Outside of work she enjoys spending time with her family, sewing and crafting, and traveling.

## Staff Continue to Give Back

Department staff members continue to participate in various events and fundraisers to benefit the community. The Department's most recent community-focused activity was the hospital-wide donation drive for the "Education Project." This year, donations were collected in early September and distributed to three agencies: Education Project for Homeless Youth, Ozone House, and Community Action Network, all of which support families in under-resourced Washtenaw County neighborhoods. One event that has become popular in recent years is the "Souper Bowl" fundraiser, where volunteers within the Department cook different kinds of soup and taste-testers donate money to sample each one. This year, funds raised were used to purchase materials to create tie-up fleece blankets for patients admitted to our inpatient unit, 4A. Another staff fundraiser is the collection of dollars for casual jean Fridays. Each holiday season, funds raised throughout the year go toward supporting a cause that's important to the staff. Most recently, gifts were purchased for one of Dr. Murasko's patients, a 5-year-old girl who lost her vision due to trauma. Braille books were purchased from a local non-profit organization, Seedlings, along with sensory gifts and toys.

Other community-focused events have included an annual food drive, a book drive, and preparation of dinner at the Ronald McDonald House. Events like these are organized and supported by our Employee Engagement Workgroup. Our staff plan to continue finding new and meaningful ways to give back to the community around them.

## DEI Efforts Continue

As we embark on the fourth year of the University's Diversity, Equity and Inclusion (DEI) Initiative, the Department has made significant strides toward a more inclusive and diverse workplace for all. The DEI Workgroup's spring project, the Kindness Journal, was carried out in conjunction with our MHealthy champion. The journal was given to staff who took the "Kindness Pledge," and weekly emails were sent with a writing prompt with such topics as empathy, intentionality, stress reduction, and teamwork. This project was highlighted in a presentation to DEI Leads across the University and was recognized at the University-wide Annual Symposium in April.

In October, the University launched its first DEI Climate Survey to gauge the impact that DEI efforts have had on the organization to date. Throughout the year, the DEI Workgroup has worked with the Employee Engagement Workgroup and our community outreach coordinator to host events, volunteer time in the community, and foster an environment of inclusivity. The group looks forward to launching an educational series in the spring of 2020.



## Steve Napolitan Elected Treasurer of NERVES



Neurosurgery Chief Department Administrator Steve Napolitan was elected this year to serve as Treasurer of the Neurosurgery Executives Resource Value & Education Society (NERVES) after completing a two-year term as the North/Midwest Regional Director for the Society. His term as Treasurer, which will last for two years, took effect at the 2019 NERVES Annual Meeting, which took place April 11-13 in San Diego.



## U-M Neurosurgery Nurse Practitioners Receive Proclamation from Ann Arbor Mayor

As the American Association of Nurse Practitioners (AANP) Michigan State Representative, neurosurgery inpatient nurse practitioner Ericka Brunson-Gillespie DNP, NP, requested a proclamation for the 2019 Nurse Practitioner Week (November 10-16) from the city of Ann Arbor Mayor, Christopher Taylor. The request was granted this fall, and the proclamation was presented in September to Ericka, along with lead inpatient nurse practitioner Carina Brake, NP, and Joyce Wilson-Eder, a nurse practitioner student who works in Neurointerventional Radiology (pictured left to right below, with Ann Arbor mayor second from left). “We appreciate the Mayor acknowledging the hard work of nurse practitioners in the city of Ann Arbor,” Ericka said.



## Susie Hines Receives 2019 GME Program Administrator Award & Gives National Talk

Susie Hines, Neurosurgery's Graduate Medical Education Program Administrator, received the prestigious 2019 Graduate Medical Education Program Administrator Excellence Award in April this year. Susie was nominated for this award by her colleagues; it is given to those who have made exceptional contributions to graduate medical education. “Susie’s dedication to the residency program has impacted the entire Department of Neurosurgery in so many ways. It is great to see that her work has now been recognized outside of the department as well,” said Dr. Cormac Maher, Residency Program Director.



Left to right: Sybil Biermann, MD, Designated Institutional Official of the GME office, Susie Hines, and Michelle Caird, MD, GME Education Awards Selection Committee chair

Additionally, Susie presented to a national audience at the 11th Annual Neurosurgery Program Coordinators Meeting, which was held in Seattle in May in conjunction with the annual Society of Neurological Surgeons (SNS) Meeting. Susie’s presentation focused on the recent U-M Market Title Series Project, which went into effect in January, 2019, and created a new, standalone Market Title series and career trajectory for Medical Education Program Administrators throughout the University. Susie was intimately involved in this project and played a large role in its success. In sharing U-M’s process for making the goal of a Medical Education Program Administrator Market Title a reality, the movement has been furthered nationally with other education programs in hopes that they, too, will find success in reclassifying their GME workforces, thereby creating national market data for this job role.

Susie was also selected as Program Administrator Representative on the GME Contract Collective Bargaining Team this year.

# U-M Neurointerventional Radiology Team Celebrates 15 Years

This year, the U-M neurointerventional radiology team celebrated 15 years of exceptional teamwork and world-class patient care.

Neurointerventional radiology uses minimally-invasive procedures to diagnose and treat various cerebrovascular disorders involving the brain, head, neck, orbit, spine and spinal cord regions. The team consists of specialists in neurointerventional radiology and neuroendovascular surgery who are leaders in their fields and who work collaboratively alongside nurses, nurse practitioners, physician assistants, radiology technologists, clinical engineers, administrators, schedulers, administrative assistants, and numerous other support staff to provide superior quality care to patients and their families. The past 15 years have been marked by many milestones. Here's a closer look at some of the impressive work that has been performed.

## Clinical Care

Since its inception, "Team Neurointervention" has become an integral clinical component of Michigan Medicine's Comprehensive Stroke Center. There has also been immense growth in the volume of thrombectomy cases, from 15 in 2013 to 150 in 2018 — a 10-fold increase in just five years — and the team has sustained its clinical activity in the treatment of aneurysms. The team has also established the only intra-arterial treatment of retinoblastoma center for pediatric patients in Michigan. In collaboration with ophthalmology and pediatric hematology/oncology, this program is thriving, with 50 IA sessions now performed each year. Additionally, the Head, Neck, Face and Orbit Vascular Malformation Percutaneous Treatment Program has become well-established over the past decade.

## Research

In the research realm, the neurointerventional radiology team has authored numerous peer reviewed publications. Additionally, there are two R21 grants and an RO1 grant to the team's credit, centered on improving outcomes in patients with intracerebral hemorrhage, as well as a Coulter innovation grant to support the development of a thrombectomy device. The group also participated in a seminal multicenter trial, DEFUSE 3, which established level one evidence for mechanical thrombectomy in late-presenting ischemic stroke patients and was published in the *New England Journal of Medicine*.



## Education

In the last 15 years, the neurointerventional radiology team has trained a robust mix of radiologists and neurosurgeons in neurointervention. The group has also established didactic lecture sessions for the neurointerventional fellows, residents, and nurses in neurology, neurosurgery, emergency medicine, ophthalmology, radiology, vascular surgery and otorhinolaryngology. Additionally, the joint Neurointerventional Fellowship was accredited by the Society of Neurological Surgeons (SNS) Committee on Advanced Subspecialty Training (CAST) in January 2018. Training expands beyond the physicians and even includes a collaborative partnership with Metro Hospital for advancing technologist training, sharing best practices and workflow optimization. All providers across sites are certified by CAST in Neuroendovascular Surgery, a feat not many programs in the country can claim. "I feel privileged to be a part of the superlative neurointerventional team in the country, if not the world," said Neeraj Chaudhary, MD, Associate Professor of Radiology. "In the next 15 years, we look forward to even deeper collaboration and the prospect of becoming the beacon of the specialty to help more patients with diseases of the central and peripheral nervous system in adults and pediatrics, enhance our learning, and share the knowledge for the benefit of all."

## Foundations & Thanks

The foundations of the U-M neurointerventional radiology team were laid in 2005 by Greg Thompson, MD, John E. McGillicuddy Professor of Neurosurgery, and Joseph Gemmete, MD, Professor of Radiology. Drs. Thompson and Gemmete served as the vanguards of the specialty at U-M for several years and, in 2008, the team began to grow and take shape. Aditya Pandey, MD, Associate Professor of Neurosurgery, joined in 2008, Dr. Chaudhary in 2009, and Julius Griauzde, MD, Assistant Professor of Radiology, in 2018.

"We should take this opportunity to salute all of our NIR staff who have done so much to contribute to our team and to superb patient care. This group deserves recognition for its professionalism, reliability, work ethic and continued high level of commitment to exceptional patient care," said Dr. Thompson. "I feel very fortunate to work with such an outstanding group."

# Wife of Detroit Lions Quarterback, Kelly Stafford, Shares Her Acoustic Neuroma Journey

After being diagnosed with an acoustic neuroma, Kelly Stafford and her husband, Matthew, visited physicians all across the country to find the right neurosurgeon to perform her brain surgery. After visiting Michigan Medicine and meeting Dr. Greg Thompson, they knew they had found exactly what they were looking for.

In April of 2019, Kelly Stafford, who is well known as the wife of Detroit Lions quarterback Matthew Stafford, underwent surgery for an acoustic neuroma by the Dr. Greg Thompson, John E. McGillicuddy Professor of Neurosurgery within the U-M Department of Neurosurgery. After undergoing a successful 12-hour surgery and since beginning her intensive road to recovery, Kelly has been using her large public platform, especially her social media following, to raise awareness about her experience with acoustic neuroma and brain surgery, as well as her experience being a patient at Michigan Medicine. Kelly shared in an Instagram post several weeks after the surgery that she and Matthew had visited doctors all over the United States after she received her initial diagnosis, but once they met with Dr. Thompson, it became an incredibly easy decision.

*“Dr. Thompson had not only done about 2,000 acoustic neuroma cases and published outstanding results when attempting to preserve facial and hearing function, but when I spoke with him, he reminded me of my dad. He truly cared and was empathetic, which meant so much to me.”*

Kelly has continuously praised Dr. Thompson and his clinical team, including colleagues from Otolaryngology, for their clinical expertise, compassion, and ultimately, the successful outcome of her surgery. “I will forever be in debt to this man and his team. I can’t express how grateful I am for him... his kindness, empathy, patience, knowledge and steady hands.” In addition to sharing her journey of diagnosis, surgery, and recovery on social media, Kelly has also been featured, along with Dr. Thompson, in broadcasts on several local and national media outlets. An in-depth, multiple-part story aired in several installments on Detroit’s local Channel 4 (WDIV) station in September, followed by the story airing nationally on the Today Show in the same month. Kelly’s story was also aired by ESPN in October. In sharing her own story, Kelly has urged others to listen to their bodies when they suspect something is off. “It’s so important to really know yourself and know your body. Know if there’s something just feels a little bit off to go in and get it checked out. It can take five minutes at a medical clinic to make sure everything is okay.”



# Smiling Again: How Acoustic Neuroma Brain Surgery Changed My Life

In February of 2018, Melissa Smith, co-host of “the four,” a lifestyle show on 9&10 News in Northern Michigan, underwent brain surgery for an acoustic neuroma at Michigan Medicine. Here, she shares her own story of diagnosis, surgery, and recovery.

## The Diagnosis

I was diagnosed with an acoustic neuroma in 2010. My primary care doctor sent me for an MRI because of chronic migraines, and the scan picked it up as a small speck. I wasn't having any symptoms. In fact, I was told the migraines were probably not even from the tumor. One doctor told me these types of tumors are slow growing and surgery may do more damage, so watching and waiting might be best. During the years that followed, annual MRIs showed little to no growth. Feeling optimistic, I eventually stopped going for the follow-ups.

## Divine Intervention

In August 2017 I scheduled an appointment with my ear, nose, and throat doctor for what seemed like laryngitis. Looking back, I feel I was led to this office visit through divine intervention. At the appointment, the doctor asked about my yearly MRIs. I smiled. “Oh, I'm fine!” I joked. “I stopped going for those!” He immediately scheduled an MRI for me. A week later, he called with the results. I was sitting with my now-husband, Phil, at our kitchen table talking about our upcoming wedding. We were less than a year out, and like any bride-to-be, I was ecstatic about what was ahead. He shared that the acoustic neuroma had grown significantly and was nudging up against the base of my brain; it needed to come out as soon as possible. The tumor was considered medium to large, and he was shocked I wasn't having symptoms. A million thoughts raced through my mind, from how this would impact my job as a news anchor, to my wedding, to life in general.



## The Surgery

I researched extensively over the next several weeks and scheduled consultations with University of Michigan neurosurgeon Dr. Byron Gregory Thompson and Dr. Hussam El-Kashlan, a U-M head and neck surgeon. These two became my “dream team.” Hearing, balance, and facial nerve tests prior to surgery all came back normal, but I was told my balance on the right side was weakened from the tumor. I was also told that after surgery I could experience dizziness and may have to learn to regain my balance. There was also a chance I would lose hearing on my right side and have facial paralysis. “What if I can't walk down the aisle for my wedding?” “What if I don't look like myself or can't hear when I recite my vows? If I have kids one day, will I be able to hear them?” For months, these thoughts consumed me. Then finally, on Monday, Feb. 12, 2018, I was wheeled in for surgery. The day of surgery felt like a dream. Since U-M is a teaching hospital, the OR looked like a classroom with medical students sitting in. The anesthesiologist tried to make me feel relaxed. As he placed an oxygen mask on my face, he asked, “Where would you like to go during your surgery, while you're sleeping?” “I want to go to my favorite beach on Lake Michigan. It's called Port Oneida.” He shouted to the whole surgical room I was going to Lake Michigan and they all cheered and started clapping. It gave me a sense of comfort. One of my surgeons stood over me, smiling. He looked down and asked if there was anything else. “Yes. I just want to come out of this as the same Melissa,” I said.

## The Recovery

It seemed like all of five minutes had gone by when I opened my eyes in the ICU. The room seemed blurry. In front of me, I saw my family and Phil smiling. My mom smiled and told me I had been in surgery for 13 hours. The surgeons had gotten the entire tumor. I couldn't format sentences and had a hard time putting simple words together. I was away from work for more than two months, regaining my balance with physical therapy. During most of this time, the right side of my face was paralyzed. I couldn't close my right eye for several weeks, and couldn't chew or taste food on my right side. I also had a constant loud buzzing in my ear. But, the worst part was that I couldn't fully smile. Once I returned to work in April and life returned to a new normal, I debated canceling our upcoming wedding. In my heart, though, I knew I couldn't let the tumor get in the way of life. As planned, Phil and I were married on July 14, just five months after my surgery. It was the best day of my life. When I walked down the aisle with both of my parents, I felt strong. My balance didn't let me down, and my smile didn't either.

## Today

Brain surgery forced me to accept that some things are out of my control. I continue to remind myself that I'm extremely blessed for the miracle surgeons at the University of Michigan. They saved me from something that could have caused irreversible damage or worse to my body. I've learned how sensitive, yet resilient and brilliant, the human body is. On Feb. 12, as I struggled to lift my bandaged head in the ICU and format sentences, I never thought I would smile with my mom during my wedding rehearsal, dance with my dad during my reception, or laugh with Phil while we celebrated our wedding. But I was able to do all of that, and more.

Excerpt from story originally published in Grand Traverse Woman magazine; republished on Michigan Health Blog with permission.

# RESEARCH NEWS

## News from the Castro-Lowenstein Neuro-Oncology Laboratory

The Castro-Lowenstein Laboratory has a longstanding record of excellence and innovation in the discovery of the cellular, molecular, and mathematical basis underlying the growth patterns of malignant brain tumors, and in cancer cell interactions with the tumor microenvironment in both experimental models and human patients. Dr. Maria Castro, R.C. Schneider Collegiate Professor of Neurosurgery, and Dr. Pedro Lowenstein, Richard C. Schneider Collegiate Professor of Neurosurgery, have a vision to develop and implement transformative novel treatments to patients with brain tumors. In 2019, the Laboratory made unprecedented advances toward realizing this goal.

In a five-year study recently published in *Science Translational Medicine*<sup>1</sup>, the Castro-Lowenstein team reported findings that will impact the treatment of low-grade gliomas. The team developed the first genetically engineered animal model of low-grade gliomas, in which the IDH1 gene is mutated. In humans, these tumors occur at a young age. Although survival can be 7-10 years, the tumors relapse following initial treatment with surgery and chemotherapy. In their new mouse model, the team demonstrated that tumor formation requires not only the IDH1 mutation but also additional mutations in p53 and ATRX. When all three mutations are present, mutated IDH1 increases the tumor cells' response to radiation-induced DNA damage, reducing the efficacy of the radiation treatment. The addition of a drug that inhibits a critical pathway in DNA damage repair restored tumor sensitivity to radiation. The researchers confirmed their findings in human tissue samples, suggesting that a precision medicine approach to gliomas would improve treatment. The FDA has already approved DNA repair blockers for other cancers. The researchers are working to translate their findings into a clinical trial.

In another paper, published in *ACS Nano*<sup>2</sup>, the team, in collaboration with Dr. Anna Schwendeman's laboratory in the School of Pharmaceutical Sciences, reported the use of high-density lipoprotein nanodiscs to co-deliver chemo- and immune-therapeutics for high-grade gliomas. In this study, docetaxel (DTX), a widely used chemotherapeutic agent, was incorporated into high-density lipoprotein nanodiscs that were coupled with CpG adjuvant. Local treatment of gliomas with the nanodiscs resulted in sustained release of the drug formulation at the tumor site while avoiding adverse off-target toxicity. These findings represent a powerful new approach for glioma chemo-immunotherapy. Local drug delivery at the time of surgery may offer the advantages of treating residual disease and extending the period to recurrence, resulting from the anti-glioma immunological memory response.

Enrollment of adult glioma patients at U-M was recently completed for the Phase I clinical trial of a novel immunotherapy approach pioneered by the Castro-Lowenstein team<sup>3</sup> that uses gene therapy-mediated delivery of therapeutic genes into brain tumor, eliciting the reprogramming of the patient's own immune system. This approach uses a combination of viral vectors that encode (1) a gene that induces tumor cell death, and (2) another gene that trains the patient's immune system to recognize and kill any remaining tumor cells. The viral vectors are delivered into the tumor cavity to trigger an effective anti-tumor immune response. The clinical trial aims to treat the most aggressive form of brain cancer, glioblastoma multiforme. This approach could be key to improving outcomes for patients with brain tumors.

### REFERENCES

1. Nunez FJ, Mendez FM, Kadiyala P, Alghamri MS, Savelieff MG, Garcia-Fabiani MB, et al. IDH1-R132H acts as a tumor suppressor in glioma via epigenetic up-regulation of the DNA damage response. *Sci Transl Med.* 2019;11(479). DOI: 10.1126/scitranslmed.aag1427
2. Kadiyala P, Li D, Nunez FM, Altshuler D, Doherty R, Kuai R, et al. High-density lipoprotein-mimicking nanodiscs for chemo-immunotherapy against glioblastoma multiforme. *ACS Nano.* 2019;13(2):1365-1384. DOI: 10.1021/acsnano.8b06842
3. Lowenstein PR, Orringer DA, Sagher O, Heth J, Hervey-Jumper SL, Mammoser LJ, et al. First-in-human phase I trial of the combination of two adenoviral vectors expressing HSV1-TK and FLT3L for the treatment of newly diagnosed resectable malignant glioma: Initial results from the therapeutic reprogramming of the brain immune system. *J Clin Oncol.* 2019, 37, suppl: abstr Board #208.

# News from the Crosby Neurosurgical Laboratories

Dr. Ya Hua, Research Professor of Neurosurgery, has been examining the role of clot-derived neurotoxic factors in brain injury after intracerebral hemorrhage. Her team has found that peroxiredoxin 2 (PRX2), a protein that is very highly expressed in red blood cells, has profound pro-inflammatory effects contributing to brain injury. This work, recently funded by the National Institutes of Health (NIH), has been published in *Translational Stroke Research*<sup>1</sup>. Over the last year, Dr. Nick Szerlip, Associate Professor of Neurosurgery, and Dr. Alexandra Calinescu, Research Assistant Professor of Neurosurgery, have set up and settled into their Crosby Laboratory space and spring-boarded their projects on spinal metastatic disease and engineering neural stem cells for the treatment of glioblastoma. Dr. Calinescu was awarded the Undergraduate Research Opportunity Program (UROP) Outstanding Research Mentor Award for her effort in guiding the projects of three undergraduate students, all of whom will be presenting their work at national meetings this year: Society for Neuroscience and Society for Neuro-Oncology.

One of our affiliated faculty, Anuska Andjelkovic, MD, PhD, Associate Professor of Pathology, has been studying the unusual roles of a gap junction protein, connexin 43, in brain endothelial cells. Collaborating with Richard Keep, PhD, Director of the Crosby Neurosurgical Laboratories, she has identified an important role of a truncated form of this protein in cell signaling and blood-brain barrier disruption in both cavernous malformations and cerebral amyloid angiopathy. This work has recently been funded with two R01 grants from the NIH. One resource for resident training is an NIH R25 grant that was refunded this year (2019-2024). This grant, which represents a collaboration between Neurology, Neurosurgery and Neuropathology, funds a residency-fellowship training program – the U-M Clinical Neuroscientist Training Program – to advance talented junior clinician-neuroscientists rapidly to

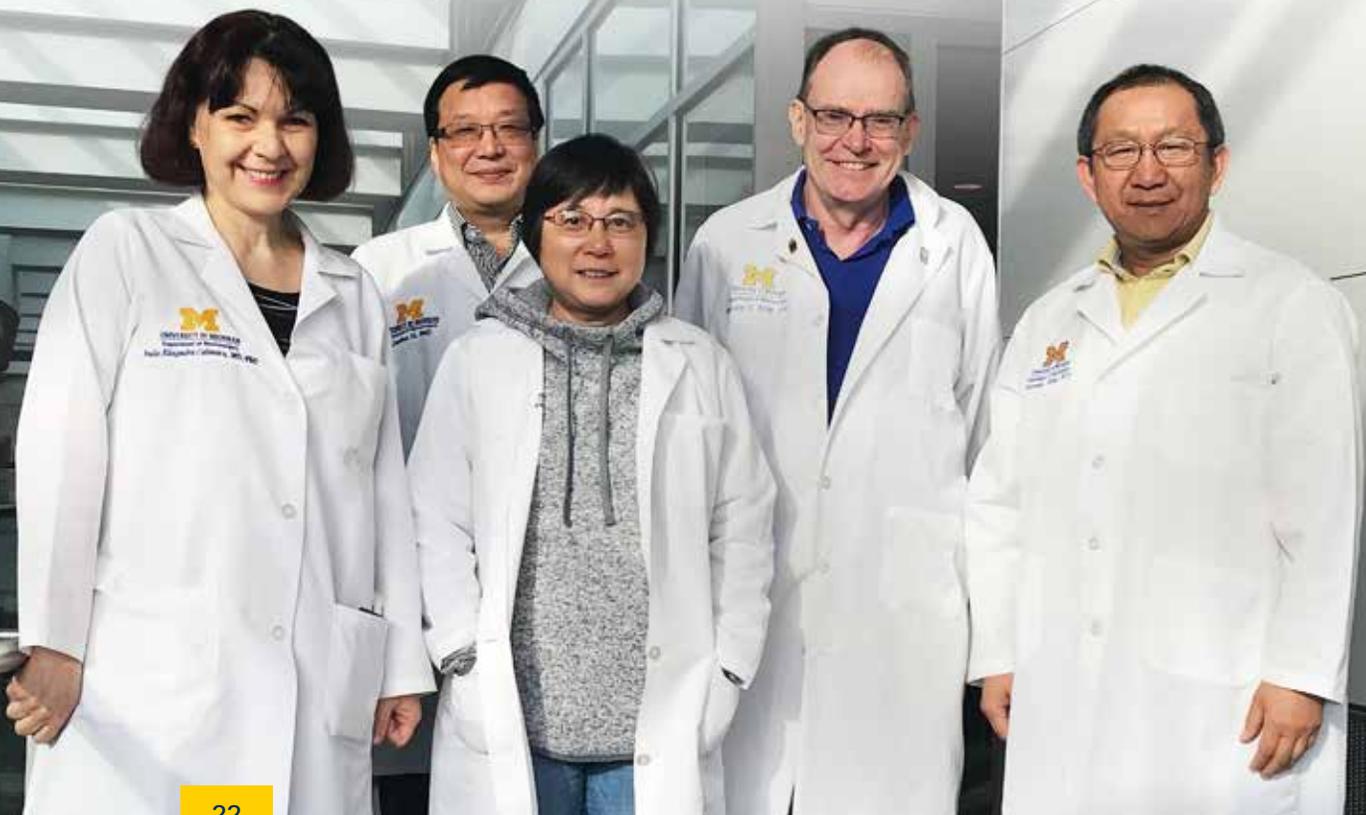
independence, thus helping to produce the next generation of physician scientists. U-M Neurosurgery graduate Dr. Kevin Chen (2018) is a past recipient of this award. A focus of Dr. Guohua Xi, Richard C. Schneider Research Professor of Neurosurgery, and his collaborators in the Crosby Laboratories has been the role of hemoglobin and its degradation product, iron, in brain injury after intracerebral hemorrhage. Preclinical results from this work led to a Phase II clinical trial of an iron chelator, deferoxamine, for intracerebral hemorrhage. The results of this trial, i-DEF, were published this year in *Lancet Neurology*<sup>2</sup>. Discussions are ongoing about a Phase III trial.

Members of the Crosby Neurosurgical Laboratories continue to serve on multiple editorial boards. Guohua Xi serves as Associate Editor for both the *Journal of Cerebral Blood Flow and Metabolism* (impact factor 6.0) and *Translational Stroke Research* (impact factor 5.8), and Richard Keep is co-Editor-in-Chief of *Fluids and Barriers of the CNS* (new impact factor 3.7). Dr. Xi also co-edited a special issue of *CNS Neuroscience & Therapeutics* entitled, 'Hemorrhagic stroke', while Dr. Keep co-edited a special issue of *Neurobiology of Disease* entitled, 'Stroke: the impact of aging on brain injury and recovery'. Dr. Keep has also been appointed to the Scientific Advisory Board of the Hydrocephalus Association beginning in 2020.

1. Bian L, Zhang J, Wang M, Keep RF, Xi G, Hua Y. Intracerebral hemorrhage-induced brain injury in rats:

The role of extracellular peroxiredoxin 2. *Transl Stroke Res.* 2019. DOI: 10.1007/s12975-019-00714-x

2. Selim M, Foster LD, Moy CS, Xi G, Hill MD, Morgenstern LB, et al. Deferoxamine mesylate in patients with intracerebral haemorrhage (i-DEF): a multicentre, randomised, placebo-controlled, double-blind phase 2 trial. *Lancet Neurol.* 2019;18(5):428-438. DOI: 10.1016/S1474-4422(19)30069-9



# MICHIGAN MEDICINE NEWS

## History in the Making: Michigan Medicine Introduces Hospital of the Future

Michigan Medicine announced in September plans to build a new adult hospital that will increase patient access and transform medical and surgical care. The new 12-story hospital will house 264 private rooms equipped for universal intensive care, a state-of-the-art neurological and neurosurgical center, high-level, specialty care services for cardiovascular and thoracic patients, along with advanced imaging.

U-M's Board of Regents unanimously approved the five-year project on Sept. 19, 2019. The new 690,000 gross-square-foot hospital will provide more access to care for adult patients at Michigan Medicine, where current hospital facilities often operate at more than 90% capacity. A groundbreaking ceremony was held on Oct. 25, 2019 to officially mark the beginning of the construction phase of the project. "We are proud to be at the forefront of innovation with a new hospital that will support the extraordinary work of our faculty, nurses and other providers and our research community," said Marshall Runge, MD, PhD, the executive vice president of medical affairs for U-M, CEO of Michigan Medicine and dean of the Medical School. "It's an investment in Michigan Medicine's mission of advancing health to serve Michigan and the world."

In keeping with the University's commitment to prioritize sustainability and reduce its carbon footprint, Michigan Medicine is working with its team of architects and engineers to achieve LEED Gold status for the project. LEED provides a framework to create healthy, highly-efficient and cost-saving "green" facilities. Michigan Medicine brought together many people from across the medical campus and university to participate in the extensive team planning process for the new hospital.

Nurses, physicians, administrative leaders, faculty and staff as well as patients and families have been involved since the beginning of the planning process to help ensure that the new facility meets the many different needs of those it will serve. According to David Spahlinger, MD, president of the University of Michigan Health System, the clinical arm of Michigan Medicine, "The new adult inpatient hospital will allow for the relocation of 110 beds currently in semi-private rooms at University Hospital to the new hospital. As a result, all Michigan Medicine inpatient beds will be single private rooms. "Private rooms are important for the quality of our patient and family member experience, and they are a proven factor in reducing hospital-acquired infections." After construction of the new rooms and relocation of the existing beds, the project will add a total of 154 new beds to the medical campus. The building will be constructed adjacent to the Frankel Cardiovascular Center, with plans for bridge and tunnel connections to existing inpatient care facilities. Planning for incremental parking, transportation and roadway improvements is underway. Funding for the project will be provided from Michigan Medicine resources, but Michigan Medicine also is launching a philanthropic campaign.

"We invite the community to join us in building the new hospital. Contributions will fuel progress across the neurological and neurosurgical care, cardiovascular, thoracic and other critical areas of care, ensuring the greatest possible impact for patients and families as well as for medical research and education," said Eric Barritt, Associate Vice President and Chief Development Officer.

To learn more, please visit  
[uofmhealth.org/hospitalofthefuture](http://uofmhealth.org/hospitalofthefuture).

The new hospital was designed with lean principles for efficiency of flow and responsiveness to user needs, including:

- Family spaces throughout and space for loved ones to visit in each patient room
- Centralized collaboration spaces in each patient area to enhance continuity of care
- Two floors with 20 operating rooms built with the latest technology, many larger than Michigan Medicine's current ORs, and three interventional radiology suites
- Patient rooms that allow for more complex care, including capability for all spaces to support intensive care



## Michigan Medicine Statewide Affiliations Update

Michigan Medicine's vision and long-term strategic goal is to build a statewide system of care that will effectively manage care for 400,000 lives locally, serve the full health care needs of 3.5 million lives across the state of Michigan and beyond, and improve the value of care for all. This statewide



system of care includes a variety of partnerships and affiliation structures, including but not limited to hospital owned interests in Metro Health, MidMichigan Health, and St. Joseph Mercy Chelsea, as well as master affiliations with Trinity Health Michigan and Sparrow Health System. Great strides continue to be made in achieving Michigan Medicine's strategic goal. Several developments launched in fiscal year 2019 in support of this strategy are outlined below.

**St. Joseph Mercy Chelsea:** Beginning in July 2018, St. Joseph Mercy Health and U-M have partnered to provide care through a joint venture at St. Joseph Mercy Chelsea. The coming together of our two award-winning health systems allows us to share knowledge, resources, best practices, patient protocols and more to drive innovation and a higher level of care. U-M family medicine and ophthalmology providers have been caring for patients in Chelsea for over a decade. They are now joined by U-M surgeons, urologists and gynecologists, many of whom see patients in clinics in Chelsea as well as perform procedures at St. Joseph Mercy Chelsea.

**St. Joseph Mercy Ann Arbor - 10 East Medicine Unit:** As of September 2018, through an innovative collaboration, patients can be admitted to a special Michigan Medicine-staffed unit on the 10th floor of St. Joseph Mercy Ann Arbor. The unit is designed to provide care for patients with general medical needs and elderly patients who can benefit from some of the specialized geriatric staffing and features present on the unit.

**Sparrow Health:** In March 2019, Sparrow Health System and Michigan Medicine signed an affiliation agreement paving the way for ongoing collaboration between the two systems. Both organizations are committed to providing the right care, at the right time, in the right place through shared clinical goals and ensuring patients have access to specialty care options near their local communities. Since March, the parties initiated the first implementation of the agreement, a joint venture integrating the pediatric services offered through Sparrow Children's Center in Lansing. The affiliation agreement also signals an intention to work together on future opportunities that may be developed by teams of physicians and leaders from both systems.

## U-M Medical School Continues Preparations for LCME Reaccreditation Process



**MEDICAL SCHOOL**  
UNIVERSITY OF MICHIGAN

In fall 2018, the University of Michigan Medical School (UMMS) began preparing for the Liaison Committee on Medical Education (LCME) reaccreditation process. The LCME – an organization that provides programmatic accreditation to medical schools in the United States and Canada – will meet with UMMS faculty, students, and administrators during the reaccreditation site visit, which will take place April 19-22, 2020. Much work has been done to date to prepare for this site visit, and efforts will continue through the conclusion of the reaccreditation process. This accreditation spans an eight-year term.

In anticipation of the 2020 LCME site visit, UMMS has been conducting an ongoing self-assessment of its medical education program and curriculum to increase awareness of competencies and competitiveness with peer schools. Committees of UMMS leadership, faculty and staff were formed to carry out the self-study process. The LCME Self-Study Task Force has been overseeing all activities of the reaccreditation process. Subcommittees focused on Admissions/Records, Student Support, Advising, Coaching; Curricular Management and Assessment; Curricular Objectives and Content; Faculty; Independent Student Analysis; Learning Environment and Wellness; Organization and Leadership; and Resources have taken on extensive duties related to the self-study process.

The LCME mock site visit took place in September this year and achieved two key goals: to receive feedback on UMMS's reaccreditation materials and progress toward compliance, and to determine the UMMS educational community's readiness for the April 2020 site visit. Mock interviewers left campus impressed by what they called a "great program" and "great community" of faculty, staff, and learners. From the mock site visit, a number of improvement areas were identified that are currently being addressed to ensure UMMS meets LCME accreditation standards at the 2020 official visit.

The LCME's accreditation decision will be received in October 2020.

# PHILANTHROPY NEWS & IMPACT

## Working Together to Fight Pediatric Brain Tumors

Finding a treatment — and possibly a cure — for a rare but deadly brain tumor known as a pediatric high-grade glioma is a top priority for Michigan Medicine researchers. Scientists led by Drs. Maria Castro and Pedro Lowenstein from the Department of Neurosurgery's Translational Neuro-Oncology Lab are exploring how immunotherapy used to treat tumors in adults could be effective in combatting them in children — with encouraging results. (To read more about this research, see page 21.) When U-M alumna Kimberly Gilman, '89 BA, LSA, and her husband, alumnus Jeffrey Gelfand, '88 BBA, Ross, heard about this promising research, they wanted to get involved. Knowing firsthand how critical timing is in the fight against pediatric brain tumors, they wanted to help expedite the research so it could be used to treat patients sooner.

As affiliates of the Pediatric Brain Tumor Foundation (PBTf), Jeff and Kim helped make the connection between the Foundation and the Michigan Medicine lab that led to a generous gift representing almost two-thirds of the \$800,000 project goal. Funds were raised through PBTf's annual Think Fit for Kids Family Fitness Festival, chaired by Ms. Gilman. The pair's advocacy and tireless efforts will help Drs. Castro and Lowenstein and their team complete experiments to advance the research toward clinical trials and FDA approval.

"Kids diagnosed with brain cancer do not have the luxury of time. We are thrilled to have the opportunity to streamline the research process by leveraging a Michigan Medicine treatment strategy that has already been approved for adults in order to benefit the community of pediatric patients," Ms. Gilman said. While this research has been underway for a number of years, recent breakthroughs have raised the stakes in the race to move it forward. "Over the past 10 years we have witnessed the passion and commitment of Dr. Castro and Dr. Lowenstein in the fight to cure pediatric brain tumors,"



The Pediatric Brain Tumor Immunotherapy Research Team in the Castro-Lowenstein Laboratory.

said Karen Cioma-James of Leah's Happy Hearts. "We have been so proud to support their lab over the years and are incredibly excited to see how they will continue to advance their research with all the current momentum and success. To see so many generous donors and foundations, like the Pediatric Brain Tumor Foundation, come together to support the mission of this research is both exciting and inspiring. Today, more than ever before, we remain confident that we are going to find a cure." Dr. Castro agrees, "Our lab is grateful for all the support we receive from generous donors like the Pediatric Brain Tumor Foundation, Leah's Happy Hearts, Smiles for Sophie Forever, and the Chad Tough Foundation. We will continue to work our hardest until we find a cure."

Together, support from these organizations and individuals is helping to shape the future of pediatric brain tumor treatment at Michigan Medicine and beyond.



# The Far-Reaching Benefits of the Neurosurgery Residence Wellness Initiative

“Resident wellness is one of the hottest topics in medical education right now. Wellness amongst neurosurgery residents is kind of an anomaly: studies show that we are among the most burnt out residents while concurrently being among the most highly satisfied medical trainees,” says Yamaan Saadeh, MD, a sixth-year resident in the Department of Neurosurgery.

Last year, during the Department’s seminal Centennial Celebration, the Neurosurgery Resident Wellness Initiative was launched to boost the physical, mental, and emotional well-being of the newest members of the team — our neurosurgical residents. Because self-care is a vital component of professionalism, the Department is committed to supporting the physical and mental health of residents by offering nutritional snack and meal options, fitness incentives such as gym membership reimbursements, and team-building activities to build comradery amongst resident trainees.

The goal is to ensure that residents don’t become part of the 60 percent of practicing physicians who meet the criteria for burnout. Stressed health care providers can exhibit poor judgement, make bad medical decisions, and display hostility toward coworkers and patients. Workplace stress also can extend to personal lives, leading to depression, anxiety, poor sleep, and broken relationships. By fostering a satisfied and resilient workforce, physicians are more engaged and better able to fulfill their mission as clinicians.

Dr. Karin Muraszko, Julian T. Hoff Professor and Chair, is a strong proponent of the Initiative and is very grateful for the generous support from donors that have made it possible. “Our residents are our most precious commodity. They provide our patients with outstanding care while contributing new and groundbreaking knowledge to the field. This work is incredibly demanding from a psychological and physical standpoint — further underscoring how vital it is that we support the newest members of our community. They are our future and nurturing them now will allow them to flourish into the future.”

Dr. Saadeh also is grateful to the Department and alumni who have created and provided for the Neurosurgery Resident Wellness Initiative, which pays for activities like the annual neurosurgery softball tournament in New York City. “This year, everyone got involved: residents, faculty, fellows, nurses, and our administrators took part in practices, scrimmages, and cheering the team on. It was truly a whole department endeavor,” says Dr. Saadeh, who shared that the team made it to the playoffs for the first time ever this year. “We had a strong performance and an even better time.” The Initiative also sponsored a “Michigan Basketball Game Night Out” for residents and their families, as well as a Thanksgiving dinner.

The Department’s commitment to resident wellness goes well beyond activities, Dr. Saadeh says. “Our department chair, faculty, and mentors model integrity and dedication for us every day, creating a culture of wellness for everyone.” Generous support from donors and resident alumni from all over the country enables the Department to build upon this culture and ensure an enriched resident experience for the next generation of neurosurgeons.

## JOIN US: BE A VICTOR!



## VICTORS FOR MICHIGAN

The Michigan Medicine Office of Development supports the fundraising priorities of faculty and staff with the goal of accelerating breakthrough discovery, transforming patient care, developing leaders, recruiting and retaining extraordinary minds, and creating innovative environments for all.

**Join us: Be a Victor!** If you would like to learn more about philanthropy, the fundraising priorities of the Department of Neurosurgery, or how you can make a gift, please contact our development officer, Kirsten Petriches.



### Kirsten Petriches

Associate Director of Development, Neurosciences  
734-763-5240 | kagwiz@umich.edu

# Publications & Grants

## 2019 PUBLICATIONS\*

Aabedi AA, Ahn E, Kakaizada S, Valdivia C, Young JS, Hervey-Jumper H, Zhang E, **Sagher O**, Weissman DH, Brang D, **Hervey-Jumper SL**.  
Assessment of wakefulness during awake craniotomy to predict intraoperative language performance.  
*J Neurosurg*. 2019;1-8.  
DOI: 10.3171/2019.2.JNS183486

Ajmera S, Lee RP, Schultz A..., **Maheer CO**, et al.  
Postgraduate publishing output in pediatric neurosurgery: correlation with fellowship site and individual scholars.  
*J Neurosurg Pediatr*. 2019;1-9.  
DOI: 10.3171/2019.4.PEDS18717

**Altshuler DB, Wang L**, Zhao L, Miklja Z, **Linzey J**, Brezzell A, Kakaizada S, Krishna S, **Orringer DA**, Briceno EM, Gabel N, **Hervey-Jumper SL**.  
BDNF, COMT, and DRD2 polymorphisms and ability to return to work in adult patients with low- and high-grade glioma.  
*Neurooncol Pract*. 2019;6(5):375-385. Epub 2019/09/27.  
DOI: 10.1093/nop/npy059

**Andjelkovic AV, Xiang J**, Stamatovic SM, **Hua Y, Xi G**, Wang MM, **Keep RF**.  
Endothelial targets in stroke: Translating animal models to human.  
*Arterioscler Thromb Vasc Biol*. 2019;39(11):2240-2247. Epub 2019/09/13.  
DOI: 10.1161/ATVBAHA.119.312816

Baltan S, Shi Y, **Keep RF**, Chen J.  
The effect of aging on brain injury and recovery after stroke.  
*Neurobiol Dis*. 2019;126:1-2. Epub 2019/04/24.  
DOI: 10.1016/j.nbd.2019.04.001

Bapuraj JR, **Bruzek AK, Tarpeh JK, Pelissier L, Garton HJL**, Anderson RCE, Nan B, Ma T, **Maheer CO**.  
Morphometric changes at the craniocervical junction during childhood.  
*J Neurosurg Pediatr*. 2019;1-9. Epub 2019/06/22.  
DOI: 10.3171/2019.4.PEDS1968

Beeler WH, Paradis KC, **Gemmete JJ, Chaudhary N**, Kim MM, Smith SR, Paradis E, Matuszak MM, **Park P**, Archer PG, **Szerlip NJ**, Spratt DE.  
Computed tomography myelosimulation versus magnetic resonance imaging registration to delineate the spinal cord during spine stereotactic radiosurgery.  
*World Neurosurg*. 2019;122:e655-e666. Epub 2019/04/18.  
DOI: 10.1016/j.wneu.2018.10.118

Beeler WH, Speth KA, Broderick MT, Jairath NK, Ballouz D, Gharzai LA, Jackson WC, Kim MM, Owen D, **Szerlip NJ**, Paradis KC, Spratt DE.  
Local control and toxicity of multilevel spine stereotactic body radiotherapy.  
*Neurosurgery*. 2019. Epub 2019/09/22.  
DOI: 10.1093/neuros/nyz348

**Bian L, Zhang J, Wang M, Keep RF, Xi G, Hua Y**.  
Intracerebral hemorrhage-induced brain injury in rats: the role of extracellular peroxiredoxin 2.  
*Transl Stroke Res*. 2019. Epub 2019/07/06.  
DOI: 10.1007/s12975-019-00714-x

Bullard AJ, Hutchison BC, Lee J, Chestek CA, **Patil PG**.  
Estimating risk for future intracranial, fully implanted, modular neuroprosthetic systems: A systematic review of hardware complications in clinical deep brain stimulation and experimental human intracortical arrays.  
*Neuromodulation*. 2019. Epub 2019/11/21.  
DOI: 10.1111/ner.13069

Cackowski FC, Wang Y, Decker JT..., **Szerlip N**, et al.  
Detection and isolation of disseminated tumor cells in bone marrow of patients with clinically localized prostate cancer.  
*Prostate*. 2019;79(14):1715-1727. Epub 2019/08/27.  
DOI: 10.1002/pros.23896

Carr C, O'Neill BE, Hochhalter CB, **Strong MJ**, Ware ML.  
Biomarkers of Pineal Region Tumors: A Review.  
*Ochsner J*. 2019;19(1):26-31.  
DOI: 10.31486/toj.18.0110

Chan AK, Bisson EF, Bydon M..., **Park P**, et al.  
A comparison of minimally invasive transforaminal lumbar interbody fusion and decompression alone for degenerative lumbar spondylolisthesis.  
*Neurosurg Focus*. 2019;46(5):E13.  
DOI: 10.3171/2019.2.FOCUS18722

Chan AK, Bisson EF, Bydon M..., **Park P**, et al.  
Laminectomy alone versus fusion for grade 1 lumbar spondylolisthesis in 426 patients from the prospective Quality Outcomes Database.  
*J Neurosurg Spine*. 2018;30(2):234-241. Epub 2018/12/14.  
DOI: 10.3171/2018.8.SPINE17913

Chan AK, Bisson EF, Bydon M..., **Park P**, et al.  
Obese patients benefit, but do not fare as well as nonobese patients, following lumbar spondylolisthesis surgery: An analysis of the Quality Outcomes Database.  
*Neurosurgery*. 2018.  
DOI: 10.1093/neuros/nyy589

Chan AK, Bisson EF, Fu KM, **Park P**, et al.  
Sexual dysfunction: Prevalence and prognosis in patients operated for degenerative lumbar spondylolisthesis.  
*Neurosurgery*. 2019. Epub 2019/10/19.  
DOI: 10.1093/neuros/nyz406

**Chaudhary N, Pandey AS**, Griauzde J, **Gemmete JJ**, Chenevert TL, **Keep RF, Xi G**.  
Brain tissue iron quantification by MRI in intracerebral hemorrhage: Current translational evidence and pitfalls.  
*J Cereb Blood Flow Metab*. 2019;39(3):562-564.  
DOI: 10.1177/0271678X18818911

**Chaudhary N, Pandey AS**, Wang X, **Xi G**.  
Hemorrhagic stroke—Pathomechanisms of injury and therapeutic options.  
*CNS Neurosci Ther*. 2019;25(10):1073-1074. Epub 2019/10/05.  
DOI: 10.1111/cns.13225

**Chen KS**, McGinley LM, **Kashlan ON**, Hayes JM, Bruno ES, Chang JS, Mendelson FE, Tabbey MA, Johe K, Sakowski SA, Feldman EL.  
Targeted intraspinal injections to assess therapies in rodent models of neurological disorders.  
*Nat Protoc*. 2019;14(2):331-349.  
DOI: 10.1038/s41596-018-0095-5

**Chen KS, Sagher O**.  
Awake implantation of thoracic spinal cord stimulator paddle electrode and generator: 2-Dimensional operative video.  
*Oper Neurosurg (Hagerstown)*. 2018.  
DOI: 10.1093/ons/opy376

Chou D, Mundis G, Wang M..., **Park P**, et al.  
Minimally invasive surgery for mild-to-moderate adult spinal deformities: Impact on intensive care unit and hospital stay.  
*World Neurosurg*. 2019;127:e649-e655.  
DOI: 10.1016/j.wneu.2019.03.237

**Daou BJ, Koduri S, Thompson BG, Chaudhary N, Pandey AS**.  
Clinical and experimental aspects of aneurysmal subarachnoid hemorrhage.  
*CNS Neurosci Ther*. 2019;25(10):1096-1112. Epub 2019/10/05.  
DOI: 10.1111/cns.13222

**Delavari N, Geh N, Hervey-Jumper SL, McKean EL, Sullivan SE**.  
Transnasal and transoral approaches to atlantoaxial synovial cysts: Report of 3 cases and review of the literature.  
*World Neurosurg*. 2019;132:258-264. Epub 2019/09/14.  
DOI: 10.1016/j.wneu.2019.08.248

**Delavari N**, Wang AC, Bapuraj JR, Londy F, **Muraszko KM, Garton HJL, Maheer CO**.  
Intraoperative phase contrast MRI analysis of cerebrospinal fluid velocities during posterior fossa decompression for Chiari I malformation.  
*J Magn Reson Imaging*. 2019. Epub 2019/11/02.  
DOI: 10.1002/jmri.26953

Elder JB, Sherman JH, Prevedello DM, **Szerlip NJ**, Spratt DE, Shaikhouni A, et al.  
Tumor.  
*Oper Neurosurg (Hagerstown)*. 2019;17(Supplement\_2):S119-S152.  
DOI: 10.1093/ons/opy100

**Elswick CM, Khalsa SSS, Saadeh YS, Pandey AS, Oppenlander ME**.  
Spinal dural arteriovenous fistula formation after scoliosis surgery: case report.  
*J Neurosurg Spine*. 2019;1-6. Epub 2019/10/20.  
DOI: 10.3171/2019.6.SPINE19323

**Elswick CM, Strong MJ, Joseph JR, Saadeh Y, Oppenlander M, Park P**.  
Robotic-assisted spinal surgery: Current generation instrumentation and new applications.  
*Neurosurg Clin N Am*. 2020;31(1):103-110.  
DOI: 10.1016/j.nec.2019.08.012

Fernando SM, Tran A, Cheng W..., **Rajajee V**, et al.  
Diagnosis of elevated intracranial pressure in critically ill adults: systematic review and meta-analysis.  
*BMJ*. 2019;366:l4225. Epub 2019/07/26.  
DOI: 10.1136/bmj.l4225

Gabel N, **Altshuler DB, Brezzell A**, Briceno EM, Boileau NR, **Miklja Z**, Kluin K, **Ferguson T, McMurray K, Wang L**, Smith SR, Carozzi NE, **Hervey-Jumper SL**.  
Health related quality of life in adult low and high-grade glioma patients using the National Institutes of Health Patient Reported Outcomes Measurement Information System (PROMIS) and Neuro-QOL Assessments.  
*Front Neurol*. 2019;10:212.  
DOI: 10.3389/fneur.2019.00212

Geletu M, Taha Z, Arulanandam R, Mohan R, Assi HH, **Castro MG**, Nabi IR, Gunning PT, Raptis L.  
Effect of Caveolin-1 upon Stat3-ptyr705 levels in breast and lung carcinoma cells.  
*Biochem Cell Biol*. 2019. Epub 2019/04/16.  
DOI: 10.1139/bcb-2018-0367

Gerhardson T, Sukovich JR, **Chaudhary N**, Chenevert TL, Ives K, Hall TL, Camelo-Piragua S, Xu Z, **Pandey AS**.  
Histotripsy clot liquefaction in a porcine intracerebral hemorrhage model.  
*Neurosurgery*. 2019.  
DOI: 10.1093/neuros/nyz089

Griauzde J, Ravindra VM, **Chaudhary N, Gemmete JJ, Pandey AS**.  
Neuroprotection for ischemic stroke in the endovascular era: A brief report on the future of intra-arterial therapy.  
*J Clin Neurosci*. 2019;69:289-291. Epub 2019/08/23.  
DOI: 10.1016/j.jocn.2019.08.001

\*Publication dates range primarily from 11/30/18 to 11/25/19

**Gu C, Hao X, Li J, Hua Y, Keep RF, Xi G.**

Effects of minocycline on epiplexus macrophage activation, choroid plexus injury and hydrocephalus development in spontaneous hypertensive rats. *J Cereb Blood Flow Metab.* 2019;271678X19836117. DOI: 10.1177/0271678X19836117

**Hollon T, Stummer W, Orringer D, Suero Molina E.**

Surgical adjuncts to increase the extent of resection: Intraoperative MRI, fluorescence, and Raman histology. *Neurosurg Clin N Am.* 2019;30(1):65-74. DOI: 10.1016/j.nec.2018.08.012

**Hollon TC, Parikh A, Pandian B, Tarpeh J, Orringer DA, Barkan AL, McKean EL, Sullivan SE.**

A machine learning approach to predict early outcomes after pituitary adenoma surgery. *Neurosurg Focus.* 2018;45(5):E8. DOI: 10.3171/2018.8.FOCUS18268

**Holste K, Chan AY, Rolston JD, Englot DJ.**

Pain outcomes following microvascular decompression for drug-resistant trigeminal neuralgia: A systematic review and meta-analysis. *Neurosurgery.* 2019. DOI: 10.1093/neuros/nyz075

**Hooshmand M, Sorousmehr SMR, Williamson C, et al.**

Automatic midline shift detection in traumatic brain injury. *Conf Proc IEEE Eng Med Biol Soc.* 2018:131-134. DOI: 10.1109/EMBC.2018.8512243

**Horn SR, Passias PG, Oh C., Park P, et al.**

Predicting the combined occurrence of poor clinical and radiographic outcomes following cervical deformity corrective surgery. *J Neurosurg Spine.* 2019;1-9. Epub 2019/11/02. DOI: 10.3171/2019.7.SPINE18651

**Hu S, Hua Y, Keep RF, Feng H, Xi G.**

Deferoxamine therapy reduces brain hemin accumulation after intracerebral hemorrhage in piglets. *Exp Neurol.* 2019;318:244-250. Epub 2019/05/13. DOI: 10.1016/j.expneurol.2019.05.003

**Jackowiak E, Patil PG, Chou KL.**

The deep brain stimulation "tiddler syndrome". *JAMA Neurol.* 2019. DOI: 10.1001/jamaneurol.2019.0691

**Jing C, Bian L, Wang M, Keep RF, Xi G, Hua Y.**

Enhancement of hematoma clearance with CD47 blocking antibody in experimental intracerebral hemorrhage. *Stroke.* 2019;50(6):1539-1547. Epub 2019/05/16. DOI: 10.1161/STROKEAHA.118.024578

**Joseph JR, Neva J, Smith BW, Strasser MO, Park P.**

Thoracolumbar fusion in extreme obesity: Complications and patient-reported outcomes. *Int J Spine Surg.* 2019;13(1):24-27. DOI: 10.14444/6003

**Kadiyala P, Li D, Nunez FM, Altschuler D, Doherty R, Kuai R, Yu M, Kamran N, Edwards M, Moon JJ, Lowenstein PR, Castro MG, Schwendeman A.**

High-density lipoprotein-mimicking nanodiscs for chemo-immunotherapy against glioblastoma multiforme. *ACS Nano.* 2019. DOI: 10.1021/acsnano.8b06842

**Kashlan ON, Kim HS, Khalsa SSS, Ravindra S, Yong Z, Oh SW, Noh JH, Jang IT, Oh SH.**

Percutaneous endoscopic contralateral lumbar foraminal decompression via an interlaminar approach: 2-Dimensional operative video. *Oper Neurosurg (Hagerstown).* 2019. Epub 2019/06/25. DOI: 10.1093/ons/opz162

**Kashlan ON, Kim HS, Khalsa SSS, Singh R, Yong Z, Oh SW, Noh JH, Jang IT, Oh SH.**

Percutaneous endoscopic transforaminal approach for far lateral lumbar discectomy: 2-Dimensional operative video. *Oper Neurosurg (Hagerstown).* 2019. DOI: 10.1093/ons/opz037

**Kashlan ON, Wilkinson DA, Morgenstern H, Khalsa SS, Maher CO.**

Predictors of surgical treatment in children with tethered fibrofatty filum terminale. *J Neurosurg Pediatr.* 2019;1-8. Epub 2019/11/02. DOI: 10.3171/2019.8.PEDS19292

**Keep RF, Jones HC, Drewes LR.**

The year in review: progress in brain barriers and brain fluid research in 2018. *Fluids Barriers CNS.* 2019;16(1):4. Epub 2019/02/06. DOI: 10.1186/s12987-019-0124-y

**Keep RF, Xiang J.**

Unexpected encounters at the crossroads: Intersections between dopamine, the immune system and psychiatric disorders at the blood-csf barrier. *Brain Behav Immun.* 2019. Epub 2019/07/30. DOI: 10.1016/j.bbi.2019.07.030

**Khalifeh A, Berghella A, Moreno S, Corelli K, Leubner E, Saccone G, Daou B, Jabbour P.**

Stroke recurrence in pregnancy: Experience at a regional referral center. *Eur J Obstet Gynecol Reprod Biol.* 2019;236:75-78. DOI: 10.1016/j.ejogrb.2019.03.005

**Khalifeh JM, Dibble CF, Van Voorhis A, Doering M, Boyer MI, Mahan MA, Wilson TJ, Midha R, Yang LJS, Ray WZ.**

Nerve transfers in the upper extremity following cervical spinal cord injury. Part 1: Systematic review of the literature. *J Neurosurg Spine.* 2019;1-12. Epub 2019/07/13. DOI: 10.3171/2019.4.SPINE19173

**Khalifeh JM, Dibble CF, Van Voorhis A, Doering M, Boyer MI, Mahan MA, Wilson TJ, Midha R, Yang LJS, Ray WZ.**

Nerve transfers in the upper extremity following cervical spinal cord injury. Part 2: Preliminary results of a prospective clinical trial. *J Neurosurg Spine.* 2019;1-13. Epub 2019/07/13. DOI: 10.3171/2019.4.SPINE19399

**Khalsa SS.**

The future of robot-assisted spine surgery. *AANS Neurosurgeon.* 2018;27(4).

**Khalsa SS, Kim HS, Singh R, Kashlan ON.**

Radiographic outcomes of endoscopic decompression for lumbar spinal stenosis. *Neurosurg Focus.* 2019;46(5):E10. DOI: 10.3171/2019.2.FOCUS18617

**Khalsa SSS, Saadeh YS, Smith BW, Joseph JR, Oppenlander ME.**

Repair of thoracic spinal cord herniation: 2-Dimensional operative video. *Oper Neurosurg (Hagerstown).* 2019. DOI: 10.1093/ons/opy409

**Kim HS, Kashlan ON, Singh R, Adsul NM, Yong Z, Oh SW, Noh JH, Jang IT, Oh SH.**

Percutaneous transforaminal endoscopic radiofrequency ablation of the sinuvertebral nerve in an Olympian with a left L5 pedicle/pars interarticularis fracture-associated left L5-S1 disk desiccation. *World Neurosurg.* 2019;3:100032. DOI: 10.1016/j.wnsx.2019.100032

**Kim M, Kim HS, Oh SW, Adsul NM, Singh R, Kashlan ON, Noh JH, Jang IT, Oh SH.**

Evolution of spinal endoscopic surgery. *Neurospine.* 2019;16(1):6-14. Epub 2019/10/18. DOI: 10.14245/ns.1836322.161

**Kirsch M, Brown S, Smith BW, Chang KWC, Koduri S, Yang LJS.**

The presence and persistence of unrealistic expectations in patients undergoing nerve surgery. *Neurosurgery.* 2019. Epub 2019/09/11. DOI: 10.1093/neuros/nyz335

**Koduri S, Wilkinson DA, Griauzde JM, Gemmete JJ, Maher CO.**

Development of bilateral dural arteriovenous fistulae following pial synangiosis for moyamoya syndrome: case report. *J Neurosurg Pediatr.* 2019;1-5. DOI: 10.3171/2019.2.PEDS18603

**Kraemer MR, Koueik J, Rebsamen S, Hsu DA, Salamata MS, Luo S, Saleh S, Bragg TM, Iskandar BJ.**

Overdrainage-related ependymal bands: a postulated cause of proximal shunt obstruction. *J Neurosurg Pediatr.* 2018;22(5):567-577. DOI: 10.3171/2018.5.PEDS18111

**Lara-Reyna JJ, Uribe-Cardenas R, Perera I, Szerlip N, et al.**

Endoscopic removal of recurrent colloid cysts. *J Neurosurg.* 2019;1-6. Epub 2019/04/13. DOI: 10.3171/2018.12.JNS181859

**Lempka SF, Patil PG.**

Innovations in spinal cord stimulation for pain. *Curr Opin Biomed Eng.* 2018;8:51-60. Epub 2019/03/27. DOI: 10.1016/j.cobme.2018.10.005

**Levy EI, Munich SA, Rosenwasser RH, Kan P, Thompson BG.**

Introduction: Endovascular Neurosurgery. *Neurosurg Focus.* 2019;46(Suppl\_1):V1. DOI: 10.3171/2019.1.FocusVid.Intro

**Linzev JR, Burke JF, Nadel JL, Williamson CA, Savastano LE, Wilkinson DA, Pandey AS.**

Incidence of the initiation of comfort care immediately following emergent neurosurgical and endovascular procedures. *J Neurosurg.* 2018;1-9. Epub 2018/12/17. DOI: 10.3171/2018.7.JNS181226

**Linzev JR, Nadel JL, Wilkinson DA, Rajajee V, Daou BJ, Pandey AS.**

Validation of the LACE index (length of stay, acuity of admission, comorbidities, emergency department use) in the adult neurosurgical patient population. *Neurosurgery.* 2019. DOI: 10.1093/neuros/nyz300

**Linzev JR, Pandey AS.**

Does surgical start time or weekend presentation affect clinical outcome for patients presenting with neurosurgical pathology? *World Neurosurg.* 2019;123:281-282. DOI: 10.1016/j.wneu.2018.12.076

**Linzev JR, Sivakumar W, Johnson JN, Ivan ME, Haider AS, Philips CA, Than KD, Tomei KL, Muraszko KM, Nduom EK.**

Young Neurosurgeons Committee of the American Association of Neurological Surgeons: Training ground for future leaders in organized neurosurgery in the United States of America. *World Neurosurg.* 2019;123:59-63. DOI: 10.1016/j.wneu.2018.11.206

**Linzev JR, Wilkinson DA, Nadel JL, Thompson BG, Pandey AS.**

Complications in patients undergoing microsurgical clipping of intracranial aneurysms with pre-existing ventriculoperitoneal shunts following a cranial procedure. *J Stroke Cerebrovasc Dis.* 2019;28(3):845-849. DOI: 10.1016/j.jstrokecerebrovasdis.2018.11.034

**Luciano MG, Batzdorf U, Kula RW, Rocque BG, Maher CO, Heiss J, Martin BA, et al.**

Development of common data elements for use in Chiari malformation type I clinical research: An NIH/NINDS project. *Neurosurgery.* 2019. DOI: 10.1093/neuros/nyy475

**Maher CO.**

Letter to the Editor. Arachnoid cyst prevalence. *J Neurosurg Pediatr.* 2019;1-2. Epub 2019/10/20. DOI: 10.3171/2019.6.PEDS19334

Matsumoto A, Nakamura T, Shinomiya A, Kawakita K, Kawanishi M, Miyake K, Kuroda Y, **Keep RF**, Tamiya T. Histidine-rich glycoprotein could be an early predictor of vasospasm after aneurysmal subarachnoid hemorrhage. *Acta Med Okayama.* 2019;73(1):29-39. Epub 2019/03/02. DOI: 10.18926/AMO/56456

**McKean EL**, Snyderman CH.

Leadership driving safety and quality. *Otolaryngol Clin North Am.* 2019;52(1):11-22. DOI: 10.1016/j.otc.2018.08.002

McLaren RA, Jr., **Chang KW**, Ankumah NE, Yang LJ, Chauhan SP. Persistence of neonatal brachial plexus palsy among nulliparous versus parous women. *AJP Rep.* 2019;9(1):1-5. Epub 2019/01/17. DOI: 10.1055/s-0038-1677051

**Mendez FM, Núñez FJ, Garcia-Fabiani MB, Haase S, Carney S, Gauss JC, Becher OJ, Lowenstein PR, Castro MG.**

Epigenetic reprogramming and chromatin accessibility in pediatric diffuse intrinsic pontine gliomas: A neural developmental disease. *Neuro-Oncology.* 2019. DOI: 10.1093/neuonc/noz218

Miklja Z, Pasternak A, Stallard S..., **Bruzek AK**, et al. Molecular profiling and targeted therapy in pediatric gliomas: review and consensus recommendations. *Neuro Oncol.* 2019. DOI: 10.1093/neuonc/noz022

Mossner J, **Patil PG.**

Surgery of the peripheral nervous system as a treatment for pain. In: Ballantyne, Fishman, Rathmell, eds. *Bonica's Management of Pain* 5th ed. New York: Lippincott Williams & Wilkins; 2018.

Mossner JM, **Patil PG**, Chou KL.

Subthalamic nucleus deep brain stimulation improves dyskinesias in Parkinson's disease beyond levodopa reduction. *J Neural Transm (Vienna).* 2019;126(11):1479-1483. Epub 2019/09/09. DOI: 10.1007/s00702-019-02076-y

Mummaneni PV, Bydon M, Alvi MA..., **Park P**, et al. Predictive model for long-term patient satisfaction after surgery for grade I degenerative lumbar spondylolisthesis: insights from the Quality Outcomes Database. *Neurosurg Focus.* 2019;46(5):E12. Epub 2019/05/03. DOI: 10.3171/2019.2.FOCUS18734

Mummaneni PV, **Park P**, Shaffrey CI, et al.

The MISDEF2 algorithm: an updated algorithm for patient selection in minimally invasive deformity surgery. *J Neurosurg Spine.* 2019;1-8. Epub 2019/10/28. DOI: 10.3171/2019.7.SPINE181104

**Nadel JL**, Scott RM, Durham SR, **Maher CO.**

Recent trends in North American pediatric neurosurgical fellowship training. *J Neurosurg Pediatr.* 2019;1-6. DOI: 10.3171/2018.10.PEDS18106

**Nadel JL, Wilkinson DA, Garton HJL, Muraszko KM, Maher CO.**

Screening and surgery for foramen magnum stenosis in children with achondroplasia: a large, national database analysis. *J Neurosurg Pediatr.* 2018;23(3):374-380. Epub 2018/12/17. DOI: 10.3171/2018.9.PEDS18410

**Nadel JL, Wilkinson DA, Linzey JR, Maher CO, Kotagal V, Heth JA.**

Thirty-day hospital readmission and surgical complication rates for shunting in normal pressure hydrocephalus: A large national database analysis. *Neurosurgery.* 2019. Epub 2019/08/20. DOI: 10.1093/neuros/nyz299

**Nathan JK, Rodoni BM, Joseph JR, Smith BW, Park P.**

Smartphone use and interest in a spine surgery recovery mobile application among patients in a US academic neurosurgery practice. *Oper Neurosurg (Hagerstown).* 2019. Epub 2019/04/20. DOI: 10.1093/ons/onz061

**Nunez FJ, Mendez FM, Garcia-Fabiani MB, Pardo J, Edwards M, Lowenstein PR, Castro MG.**

Evaluation of biomarkers in glioma by immunohistochemistry on paraffin-embedded 3D glioma neurosphere cultures. *J Vis Exp.* 2019(143). DOI: 10.3791/58931

**Nunez FJ, Mendez FM, Kadiyala P, Alghamri**

**MS, Savelieff MG, Garcia-Fabiani MB, Haase S, Koschmann C, Calinescu AA, Kamran N, Saxena M, Patel R, Carney S, Guo MZ, Edwards M..., Hervey-Jumper S, Figueroa ME, Lowenstein PR, Castro MG.**

IDH1-R132H acts as a tumor suppressor in glioma via epigenetic up-regulation of the DNA damage response. *Sci Transl Med.* 2019;11(479). DOI: 10.1126/scitranslmed.aaq1427

Oliver CR, Altemus MA, Westerhof TM, Cheriyan H, Cheng X, Dziubinski M, Wu Z, Yates J, Morikawa A, **Heth J, Castro MG**, Leung BM, et al.

A platform for artificial intelligence based identification of the extravasation potential of cancer cells into the brain metastatic niche. *Lab Chip.* 2019;19(7):1162-1173. Epub 2019/02/28. DOI: 10.1039/c8lc01387j

**Park P, Fu KM, Eastlack RK..., Oppenlander ME, Mummaneni PV, et al.**

Is achieving optimal spinopelvic parameters necessary to obtain substantial clinical benefit? An analysis of patients who underwent circumferential minimally invasive surgery or hybrid surgery with open posterior instrumentation. *J Neurosurg Spine.* 2019;1-6. DOI: 10.3171/2018.11.SPINE181261

**Rajasee V, Diaz-Gomez JL.**

Critical care ultrasound should be a priority first-line assessment tool in neurocritical care. *Crit Care Med.* 2019;47(6):833-836. DOI: 10.1097/CCM.0000000000003712

**Rajasee V, Pandey AS, Williamson CA.**

Subarachnoid hemorrhage and therapy formerly known as "Triple-H"-New directions. *World Neurosurg.* 2019;127:500-501. DOI: 10.1016/j.wneu.2019.04.212

**Rajasee V, Williamson CA, Fontana RJ, Courey AJ, Patil PG.**

Author's response to letter to the editor: Noninvasive intracranial pressure assessment in acute liver failure. *Neurocrit Care.* 2019;30(2):497. DOI: 10.1007/s12028-019-00681-z

Roark C, Case D, Gritz M..., **Williamson CA**, et al.

Nationwide analysis of hospital-to-hospital transfer in patients with aneurysmal subarachnoid hemorrhage requiring aneurysm repair. *J Neurosurg.* 2018;1-8. DOI: 10.3171/2018.4.JNS172269

Rosenberg WS, **Patil PG**, Raslan A.

Spinal neuroablation for cancer pain. In: Gulati A, et al., eds. *Essentials of Interventional Cancer Pain Medicine.* New York: Springer; 2018.

**Saadeh YS, Elswick CM, Fateh JA, Smith BW, Joseph JR, Spratt DE, Oppenlander ME, Park P, Szerlip NJ.**

Analysis of outcomes between traditional open versus mini-open approach in surgical treatment of spinal metastasis. *World Neurosurg.* 2019. Epub 2019/06/28. DOI: 10.1016/j.wneu.2019.06.121

**Saadeh YS, Joseph JR, Smith BW, Kirsch MJ, Sabbagh AM, Park P.**

Comparison of segmental lordosis and global spinopelvic alignment after single-level lateral lumbar interbody fusion or transforaminal lumbar interbody fusion. *World Neurosurg.* 2019. Epub 2019/03/25. DOI: 10.1016/j.wneu.2019.03.106

**Saadeh YS, Khalsa SS, Smith BW, Joseph JR, Khorfan RF, Park P.**

Transthoracic discectomy for symptomatic thoracic disc herniation: 2-Dimensional operative video. *Oper Neurosurg (Hagerstown).* 2019. DOI: 10.1093/ons/opy407

**Saadeh YS, Sabbagh MA, Smith BW, Joseph JR, Buckingham MJ.**

Technique for open posterior cervical foraminotomy: 2-dimensional operative video. *Oper Neurosurg (Hagerstown).* 2019. DOI: 10.1093/ons/onz159

Sabbagh MA, De Lott LB, **Trobe JD.**

Causes of Horner syndrome: A study of 318 patients. *J Neuroophthalmol.* 2019. DOI: 10.1097/WNO.0000000000000844

**Sagher O, Levin EL, Pilitsis JG, eds.**

*Pain Neurosurgery – Neurosurgery By Example.* New York, NY: Oxford University Press; 2019

Scheetz L, Park KS, Li Q, **Lowenstein PR, Castro MG, Schwendeman A, Moon JJ.** Engineering patient-specific cancer immunotherapies. *Nat Biomed Eng.* 2019;3(10):768-782. Epub 2019/08/14. DOI: 10.1038/s41551-019-0436-x

Schultz ML, Fawaz MV, Azaria RD, **Hollon TC...**, **Orringer DA**, et al.

Synthetic high-density lipoprotein nanoparticles for the treatment of Niemann-Pick diseases. *BMC Med.* 2019;17(1):200. DOI: 10.1186/s12916-019-1423-5

Selim M, Foster LD, Moy CS, **Xi G**, et al.

Deferoxamine mesylate in patients with intracerebral haemorrhage (i-DEF): a multicentre, randomised, placebo-controlled, double-blind phase 2 trial. *Lancet Neurol.* 2019;18(5):428-438. DOI: 10.1016/S1474-4422(19)30069-9

Shoirah H, Shallwani H, Siddiqui AH..., **Pandey AS, Gemmete JJ**, Abruzzo T, et al.

Endovascular thrombectomy in pediatric patients with large vessel occlusion. *J Neurointerv Surg.* 2019;11(7):729-732. Epub 2019/03/08. DOI: 10.1136/neurintsurg-2018-014320

Singh R, Kim HS, Adsul N, **Kashlan ON**, Woon Oh S, Noh JH, Moon SC, Park CH, Jang IT, Hoon Oh S. X-rays and scans can fail to differentiate hip pathology from lumbar spinal stenosis: Two case reports. *Surg Neurol Int.* 2019;10:165. Epub 2019/10/05. DOI: 10.25259/SNI\_173\_2019

Sladojevic N, Stamatovic SM, Johnson AM, Choi J, Hu A, Dithmer S, Blasig IE, **Keep RF, Andjelkovic AV.**

Claudin-1 dependent destabilization of the blood-brain barrier in chronic stroke. *J Neurosci.* 2018. DOI: 10.1523/JNEUROSCI.1432-18.2018

Stamatovic SM, Phillips CM, Martinez-Revollar G, **Keep RF, Andjelkovic AV.** Involvement of epigenetic mechanisms and non-coding RNAs in blood-brain barrier and neurovascular unit injury and recovery after stroke. *Front Neurosci.* 2019;13:864. Epub 2019/09/24. DOI: 10.3389/fnins.2019.00864

Strahle JM, Taiwo R, Averill C..., **Maheo CO,** et al. Radiological and clinical predictors of scoliosis in patients with Chiari malformation type I and spinal cord syrinx from the Park-Reeves Syringomyelia Research Consortium. *J Neurosurg Pediatr.* 2019;1-8. Epub 2019/08/17. DOI: 10.3171/2019.5.PEDS18527

Swaid B, Kalaba F, Bachuwa G, **Sullivan SE.** Heparin-induced pituitary apoplexy presenting as isolated unilateral oculomotor nerve palsy: A case report and literature review. *Case Rep Endocrinol.* 2019;2019:5043925. Epub 2019/11/07. DOI: 10.1155/2019/5043925

Swartz L, **Holste KG,** Kim M, Morikawa A, **Heth J.** Outcomes in patients treated with laser interstitial thermal therapy for primary brain cancer and brain metastases. *Oncologist.* 2019. Epub 2019/08/24. DOI: 10.1634/theoncologist.2019-0213

Tabet A, Jensen MP, Parkins CC, **Patil PG,** Watts C, Scherman OA. Designing next-generation local drug delivery vehicles for glioblastoma adjuvant chemotherapy: Lessons from the clinic. *Adv Healthc Mater.* 2019;8(3):e1801391. DOI: 10.1002/adhm.201801391

**Tao C, Keep RF, Xi G, Hua Y.** CD47 blocking antibody accelerates hematoma clearance after intracerebral hemorrhage in aged rats. *Transl Stroke Res.* 2019. Epub 2019/10/31. DOI: 10.1007/s12975-019-00745-4

Than KD, **Park P,** Tran S, et al. Analysis of complications with staged surgery for less invasive treatment of adult spinal deformity. *World Neurosurg.* 2019. Epub 2019/03/23. DOI: 10.1016/j.wneu.2019.03.090

**Toyota Y, Wei J, Xi G, Keep RF, Hua Y.** White matter T2 hyperintensities and blood-brain barrier disruption in the hyperacute stage of subarachnoid hemorrhage in male mice: The role of lipocalin-2. *CNS Neurosci Ther.* 2019;25(10):1207-1214. Epub 2019/10/01. DOI: 10.1111/cns.13221

Walter E, **McKean EL,** Camelo-Piragua SI, Parmar HA, **Trobe JD.** Catastrophic allergic fungal sinusitis: A report of two cases. *J Neuroophthalmol.* 2019. DOI: 10.1097/WNO.0000000000000833

**Wan Y, Hua Y, Garton HJL, Novakovic N, Keep RF, Xi G.** Activation of epileptus macrophages in hydrocephalus caused by subarachnoid hemorrhage and thrombin. *CNS Neurosci Ther.* 2019;25(10):1134-1141. Epub 2019/08/23. DOI: 10.1111/cns.13203

**Wang M, Hua Y, Keep RF, Wan S, Novakovic N, Xi G.** Complement inhibition attenuates early erythrolysis in the hematoma and brain injury in aged rats. *Stroke.* 2019;50(7):1859-1868. Epub 2019/06/11. DOI: 10.1161/STROKEAHA.119.025170

Wang MY, Tran S, Brusko GD, Eastlack R, **Park P,** Nunley PD, et al. Less invasive spinal deformity surgery: the impact of the learning curve at tertiary spine care centers. *J Neurosurg Spine.* 2019;1-8. Epub 2019/08/24. DOI: 10.3171/2019.6.SPINE19531

**Wilkinson DA, Johnson K, Castaneda PR, Nadel JL, Garton HJL, Muraszko KM, Maher CO.** Obstetric management and maternal outcomes of childbirth among patients with Chiari malformation type I. *Neurosurgery.* 2019. Epub 2019/09/11. DOI: 10.1093/neuros/nyz341

**Williamson CA,** Franko LR. The authors reply. *Crit Care Med.* 2018;46(12):e1227-e1228. Epub 2018/11/18. DOI: 10.1097/CCM.0000000000003455

**Willsey M, Chiravuri S, Yang L, Patil PG.** Peripheral nerve stimulation. In: Ballantyne, Fishman, Rathmell, eds. *Bonica's Management of Pain.* 5th ed. New York: Lippincott Williams & Wilkins; 2018.

**Willsey MS, Collins KL, Conrad EC,** Chubb HA, **Patil PG.** Diffusion tensor imaging reveals microstructural differences between subtypes of trigeminal neuralgia. *J Neurosurg.* 2019;1-7. Epub 2019/07/20. DOI: 10.3171/2019.4.JNS19299

Winkler EA, Lu AY, Raygor KP, **Linzey JR,** et al. Defective vascular signaling & prospective therapeutic targets in brain arteriovenous malformations. *Neurochem Int.* 2019;126:126-138. Epub 2019/03/13. DOI: 10.1016/j.neuint.2019.03.002

Yao H, **Williamson C,** Sorousmehr R, et al. Hematoma segmentation using dilated convolutional neural network. *Conf Proc IEEE Eng Med Biol Soc.* 2018;2018:5902-5905. DOI: 10.1109/EMBC.2018.8513648

**Yee TJ, Smith BW, Joseph JR, Saadeh YS, Nathan JK,** Kahn EN, **Khalsa SS, Fearer KJ, Kirsch MJ,** Nerez DR, Chang V, Schwalb JM, Abdulhak MM, **Park P.** Correlation between the Oswestry Disability Index and the 4-item short forms for physical function and pain interference from PROMIS. *J Neurosurg Spine.* 2019;1-6. Epub 2019/08/10. DOI: 10.3171/2019.5.SPINE19400

Zakaria HM, Bazydlo M, Schultz L, Pahuta MA, Schwalb JM, **Park P,** Aleem I, Nerez DR, Chang V, MSSIC Investigators. Adverse events and their risk factors 90 days after cervical spine surgery: analysis from the Michigan Spine Surgery Improvement Collaborative. *J Neurosurg Spine.* 2019;1-13. DOI: 10.3171/2018.10.SPINE18666

Zakaria HM, Mansour TR, Telemi E, Asmaro K, Bazydlo M, Schultz L, Nerez DR, Abdulhak M, Khalil JG, Easton R, Schwalb JM, **Park P,** Chang V. The association of preoperative opioid usage with patient-reported outcomes, adverse events, and return to work after lumbar fusion: Analysis from the Michigan Spine Surgery Improvement Collaborative (MSSIC). *Neurosurgery.* 2019. Epub 2019/10/10. DOI: 10.1093/neuros/nyz423

Zakaria HM, Mansour TR, Telemi E, Asmaro K, Macki M, Bazydlo M, Schultz L, Nerez DR, Abdulhak M, Schwalb JM, **Park P,** Chang V. Use of Patient Health Questionnaire-2 scoring to predict patient satisfaction and return to work up to 1 year after lumbar fusion: a 2-year analysis from the Michigan Spine Surgery Improvement Collaborative. *J Neurosurg Spine.* 2019;1-8. Epub 2019/08/24. DOI: 10.3171/2019.6.SPINE1963

Zhu G, Sun X, Yang Y, Du Y, Lin Y, **Xiang J,** Zhou N. Reduction of BDNF results in GABAergic neuroplasticity dysfunction and contributes to late-life anxiety disorder. *Behav Neurosci.* 2019. DOI: 10.1037/bne0000301

## 2019 ACTIVE SPONSORED AWARDS / GRANTS

Engineering stem cells as diagnostic and therapeutic agents for glioblastoma  
**Calinescu A-A,** Clines G  
NIH R21 NS 107879  
6/1/2018 – 5/31/2020

Immune-suppressive myeloid cells in the glioma microenvironment: Signaling mechanisms and novel therapeutic strategies  
**Castro M, Lowenstein P**  
NIH R37 NS 094804  
9/1/2015 – 6/30/2020

Targeting ATRX-deficient pediatric GBM  
Koschmann C, **Castro M**  
NIH K08 NS099427  
12/1/2016 – 11/30/2021

Novel combined immunotherapeutic strategies for glioma: using pet dogs with spontaneous high-grade glioma  
**Castro M, Lowenstein P**  
NIH TO University of Minnesota U01 CA 224160  
9/30/2017 – 8/31/2020

Interactions between the tumor cells and the neuro-immune microenvironment in mutant IDH1 gliomas: implications for therapeutics  
**Castro M,** Ljungman M, **Lowenstein P,** Sartor M, Venneti S, Zhao L  
NIH R01 NS 105556  
4/1/2018 – 2/28/2023

Cancer Biology Training Program  
**Castro M,** Lombard D  
NIH T32 CA009676  
9/1/2018 – 8/31/2023

Immune-mediated therapies in a genetically engineered murine model of diffuse intrinsic pontine glioma  
**Castro, M, Lowenstein P, Muraszko K**  
NIH R21 NS107894  
4/1/2019 – 3/31/2021

Impact of H3G34R mutation in reprogramming the glioma immune microenvironment  
**Castro, M, Lowenstein P**  
American Brain Tumor Association BRF1900023  
10/1/2019 – 9/30/2021

Cancer stem cell niche in brain tumors  
**Fan X**  
NIH R01 CA 148621  
9/1/2011 – 6/30/2016 (NCTX) 6/30/2019

Investigating cancer stem cells – Niche interactions in brain tumor  
**Fan X**  
NIH R01 CA 163737  
9/18/2012 – 7/31/2017 (NCTX) 7/31/2019

Targeting glioblastoma stem cells through epigenetic reprogramming  
**Fan X, Muraszko K**  
NIH R01 NS 106616  
6/15/2018 – 6/30/2023

A phase 2/3 randomized, open-label study of Toca 511, a retroviral replicating vector, combined with Toca FC versus standard of care in subjects undergoing planned resection for recurrent glioblastoma or anaplastic astrocytoma  
**Heth J,** Mammoser A  
Tocagen, Inc.  
7/1/2016 – 12/31/2018 (NCTX) 6/30/2019

Lipocalin-2 and intracerebral hemorrhage-induced brain injury

**Hua Y, Keep R, Xi G**

NIH R21 NS 091545

2/1/2016 – 1/31/2018 (NCTX) 1/31/2019

Peroxiredoxin 2 and intracerebral hemorrhage

**Hua Y, Keep R, Xi G**

NIH R21 NS112394

6/1/2019 – 5/31/2021

UM Clinical Neuroscientist Training Program

Albin R, **Keep RF**

NIH R25 NS089450

7/15/2019 – 6/30/2024

Role of S100a8/A9 in blood brain barrier dysfunction after sepsis

Singer BH, Andjelkovic-Zochowska AV, Segal BM, **Keep RF**

NIH K08 NS10105403

4/1/2017 – 3/31/2022

Claudin expression profiles and blood brain barrier in aging

Andjelkovic-Zochowska AV, Stamatovic S, **Keep RF**

NIH RF1 AG057928

9/15/2017 – 6/30/2022

Early hematoma lysis and hemoglobin toxicity in intracerebral hemorrhage

**Keep R, Xi G, Hua Y, Xiang J**

NIH R01 NS 106746

3/15/2018 – 2/28/2023

Connexin-43 isoform Cx43-20kDA in cerebral cavernous malformation type 3

Andjelkovic-Zochowska AV, Stamatovic S, **Keep RF**

NIH R21 NS111205

4/1/2019 – 3/31/2021

Connexin 43 and hemorrhagic complication in cerebral amyloid angiopathy

Andjelkovic-Zochowska AV, Stamatovic S, **Keep RF**

NIH RF1 AG064957

8/1/2019 – 4/30/2024

Neuroimmunology of malignant brain tumors: Innate mechanisms

**Lowenstein P, Castro M, Nunez G**

NIH 5 R01 NS 096756

2/15/2016 – 1/31/2021

Tuning biomaterials-immune cell interactions for treatment of glioblastoma multiforme

Moon JJ, **Lowenstein P, Castro M**

NIH R01 EB022563

9/7/2016 – 5/31/2020

Mechanisms of glioma growth and invasion novel therapeutic strategies

**Lowenstein P, Castro M**

NIH 5 R01 NS 082311

4/1/2017 – 3/31/2019

Clinical study protocol to assess the safety and effectiveness of the Premia Spine TOPS system

**Oppenlander M**

Premia Spine CL-2830

7/19/2019 – 4/30/2024

MISTIE III

**Pandey AS**

NIH TO John Hopkins University U01 NS080824

1/23/2014 – 3/31/2019

Framing eighteen coils in cerebral aneurysms trial (FEAT)

**Pandey AS**

Stryker Corporation TO Vanderbilt University Medical Center

5/1/2016 – 4/30/2019

Aneurysmal subarachnoid hemorrhage trial randomizing heparin (ASTROH)

**Pandey AS**

University of Louisville Research Foundation, Inc.

4/18/2016 – 2/28/2020

The Intra-arterial vasospasm trial-A multi-center study

**Pandey AS**

The University of Texas Health Science Center at

Houston

9/11/2017 – 7/6/2019

Novel ultrasonic technique for the treatment of hemorrhagic stroke

**Pandey AS, Keep RF, Thompson BG, Xi G**

NIH R01 NS 108042

9/30/2018 – 7/31/2023

Phenomenon of ultra-early erythrolysis in intracranial hemorrhage in humans on MRI

Chaudhary N, **Pandey AS, Keep RF, Xi G**

NIH R21 NS 104663

9/30/2018 – 8/31/2020

Transcranial magnetic resonance guided histotripsy (tcMRgHt)

Xu Z, **Pandey AS**

NIH R01 EB028309

8/1/2019 – 4/30/2023

A phase 2b, randomized, double-blind, placebo-controlled study to evaluate the safety and efficacy of Staphylococcus Aureus 4-antigen vaccine (SA4Ag) in adults undergoing elective posterior instrumented lumbar spinal fusion procedures

**Park P**

Pfizer Incorporated TO inventive Health

5/20/2015 – 6/30/2019

A phase 2b/3, double-blind, randomized, placebo-controlled, multicenter study to assess the efficacy and safety of VX-210 in subjects with acute traumatic cervical spinal cord injury

**Park P**

Vertex Pharmaceuticals

8/4/16 – 1/31/2019

An ACDF multi-center study using ViviGen Cellular bone matrix

**Park P**

DePuy Orthopaedics, Inc.

12/31/2016 – 10/31/2019

Spine Surgery Clinical Fellowship

**Park P**

Neurosurgery Research and Education Foundation

(NREF)

7/1/2019 – 6/30/2020

Prospective radiographic and clinical evaluation of surgical treatment for cervical deformity: A multi-center study (PCD2)

**Park P**

DePuy Synthes To International Spine Study Group

7/1/2019 – 4/30/2029

A computational, neurobiological and clinical study of cortical connectivity during consciousness and anesthesia

Mashour GA, **Patil PG, Lee U, Chestek CA**

NIH R01 GM098578

7/15/2016 – 5/31/2020

NeuroNEXT Clinical Research Site at the University of Michigan

Albin R, Chou K, **Patil PG**

NIH U24 NS107158

7/15/2018– 6/30/2023

Regenerative peripheral nerve interface for restoring individual finger movement in people with upper limb amputations

Chestek C, **Patil PG**

NIH R01 NS105132

7/15/2018 – 6/30/2023

Neural stem cell transplantation: A novel cellular therapy for Alzheimer's disease

Feldman E, Murphy G, **Patil PG**

NIH U01 AG0575620

8/15/2018 – 7/31/2021

Evaluating the efficacy and safety of VY-AADC02 in advanced Parkinson's disease with motor fluctuations

**Patil PG**

IQVIA Holdings, Inc.

11/1/2018 – 8/31/2020

Reanimating paralyzed hands using an implantable, brain-controlled functional electrical stimulation neuroprosthesis

Chestek C, **Patil PG**

NIH F31 HD98804

5/1/2019 – 4/30/2022

Novel noninvasive methods of intracranial pressure and cerebrovascular autoregulation assessment seeing the brain through the eyes

Tiba M, **Rajajee V, Williamson C**

DOD W81XWH-18-1-0005

1/1/2018 – 1/31/2020

Stroke-related early tracheostomy versus prolonged orotracheal intubation in neurocritical care trial 2 (SETPOINT 2)

**Rajajee V**

PCORI TO Maine Medical Center

3/1/2018 – 1/30/2020

The impact of the dura mater on prostate spine metastases

**Szerlip N**

DOD W81XWH-18-1-0487

9/1/2018 – 8/31/2021

Initial clinical validation of a novel portable CT scanner in the neurological ICU

**Williamson C, Rajajee V, Sheehan K**

Xoran Technologies, LLC

5/1/2019 – 2/28/2020

Mechanisms of brain injury after intraventricular hemorrhage

**Xi G, Hua Y, Keep RF, Morgenstern L**

NIH R01 NS073595

2/15/2012 – 1/31/2017 (NCTX) 1/31/2019

Iron, minocycline and brain injury after intracerebral hemorrhage

**Xi G, Hua Y, Keep RF**

NIH R01 NS090925

5/1/2015 – 3/30/2020

Targeting CD47 to aid in clearing intracerebral hemorrhage

**Xi G, Hua Y, Keep RF**

NIH R01 NS096917

5/1/2016 – 3/31/2021

Brain iron quantification based on MRI in intracerebral hemorrhage

Chaudhary N, **Xi G, Keep RF, Pandey AS, Nan B,**

Gemmete JJ, Chenevert TL

NIH R21 NS099684

7/1/2017 – 6/30/2019 NCTX 6/30/2020



## MICHIGAN MEDICINE

UNIVERSITY OF MICHIGAN

Department of Neurosurgery  
3552 Taubman Health Care Center  
1500 E. Medical Center Dr.  
Ann Arbor, MI 48109-5338  
734-936-7010

[medicine.umich.edu/dept/neurosurgery](http://medicine.umich.edu/dept/neurosurgery)

### MICHIGAN MEDICINE LEADERSHIP

Marschall S. Runge, MD, PhD, Executive Vice President for Medical Affairs  
University of Michigan, Dean, U-M Medical School, CEO, Michigan Medicine

Eric Barritt, Associate Vice President and Chief Development Officer

Carol R. Bradford, MD, Executive Vice Dean for Academic Affairs

David Brown, MD, Associate Vice President and Associate Dean for  
Health Equity and Inclusion

Paul Castillo, CPA, Chief Financial Officer

Matthew Comstock, MBA, MHSA, Executive Director for Administration,  
Chief Operating Officer

T. Anthony Denton, JD, MHA, Senior Vice President and  
Chief Operating Officer, U-M Health System

Keith Dickey, Chief Strategy Officer

Rose Glenn, Chief Communication and Marketing Officer

Keith Gran, CPA, MBA, Chief Patient Experience Officer

Deloris Hunt, Chief Human Relations Officer

Steven Kunkel, Executive Vice Dean for Research and Chief Scientific Officer

Kara Morgenstern, JD, MPH, Associate Vice President and Deputy General  
Counsel, University of Michigan

Michael Mulholland, MD, Senior Associate Dean for Clinical Affairs and  
Executive Director, University of Michigan Medical Group

Andrew Rosenberg, MD, Chief Information Officer

Kimberly Ross, Chief Government Relations Officer

David A. Spahlinger, MD, Executive Vice Dean for Clinical Affairs;  
President, U-M Health System

Jeanne Strickland, Chief Compliance Officer, Privacy Director and  
U-M HIPAA Officer

Quinta Vreede, Chief Administrative Officer, UMHS Chief of Staff,  
Office of the EVPMA

### THE REGENTS OF THE UNIVERSITY OF MICHIGAN

Jordan B. Acker; Michael J. Behm; Mark J. Bernstein; Paul W. Brown;  
Shauna Ryder Diggs; Denise Ilitch; Ron Weiser; Katherine E. White

### NEWSLETTER DEVELOPMENT

Karin Muraszko, MD, Julian T. Hoff Professor and Chair

Cormac Maher, MD, Program Director

Steve Napolitan, Chief Department Administrator

Amy McAlister, Communications and Clinical Outcomes Manager

Tom Cichonski, Senior Editor

Susie Hines, GME Program Administrator

Kirsten Petriches, Development Officer

### NEWSLETTER DESIGN & LAYOUT

Brett Wilson, Creative Director  
[creativibe.com](http://creativibe.com)