UW Medicine
FALL 2017

THE MONTLAKE CUT

A PUBLICATION OF THE DEPARTMENT OF NEUROLOGICAL SURGERY

There have been three new Fellows added to the Department over the past few months, as well as four babies born to Department members. We have also welcomed Professor Marc Mayberg back to the faculty after an absence of nearly twenty years. Pediatric neurosurgeon Jason Hauptman has joined the faculty, and will attend at Seattle Children's Hospital in addition to pursuing his research interests in epilepsy. Our summer internship program celebrated its tenth year this past summer, an event that was punctuated by the fact that we had nearly 1,000 applicants for 12 positions. The commitment to improving the management for patients with concussion continues with a clever smartphone app designed to assess pupillary response to light at the site of an injury. Lastly, the UW TeleStroke system and its associated comprehensive neuro-vascular team is on the cutting edge of treatments for cerebrovascular disease across the state.

Richard G. Ellenbogen

Richard G. Ellenbogen, M.D., F.A.C.S.
Professor & Chairman
Department of Neurological Surgery

IN THIS ISSUE

WELCOMING NEW FACULTY

As a National Merit Scholar, **Marc R. Mayberg, MD** got going at Harvard when he lettered in football, and was a teammate of UCSF Chairman Mitch Berger's. However, he didn't get an NFL tryout as Mitch did, which probably says a lot about them both. Mark then finished up *cum laude* at Harvard in 1974.He graduated from the Mayo Medical School in 1978, and then was an intern at Tufts, a neurosurgical resident at MGH from 1979-84, and then the Van Wagenen Fellow at The National Hospital for Nervous Diseases, Queens Square in 1985, (where Victor Horsley got his start a century earlier). That same year, he joined the UW faculty for the first time as an Assistant Professor, and left in 1998 to become the Chair of the Department of Neurological Surgery at the Cleveland Clinic, a post he held until 2004. From that year until 2014, he honorably served as the Director of the Swedish Neuroscience Institute.

Along the way, Dr. Mayberg has served in executive positions on the American Board of Neurological Surgeons, AANS, CNS, Joint Section on Cerebrovascular Disease AANS/CNS, and the Stroke Council of the American Heart Association. In addition, he has been a member of the editorial board of 12 major journals, including Chair of the editorial board for the Journal of Neurosurgery. He has been a member of several study sections for the NINDS. Mark Mayberg has authored more than 200 peer reviewed papers, written 5 books and 57 book chapters.

As a senior figure in American neurological surgery, Dr. Mayberg will have broad departmental responsibilities including direct patient care and surgery, clinics, and statewide outreach and education. The faculty, residents and staff welcome Professor Mayberg back to the University of Washington School of Medicine and the Department.

Jason S. Hauptman, MD, PhD is our new pediatric neurological surgeon recruited from Southern California Kaiser Permanente. He received his BA, summa cum laude in both biology and Psychology from Muhlenberg College, and his medical degree from UMDNJ in Newark where he was elected to Alpha Omega Alpha. Jason then finished a residency and PhD at UCLA in 2014. His PhD in Neuroscience was spent studying the cortical neurophysiology of epilepsy. He then did a Fellowship in pediatric neurological surgery at Children's Hospital of Pittsburgh.

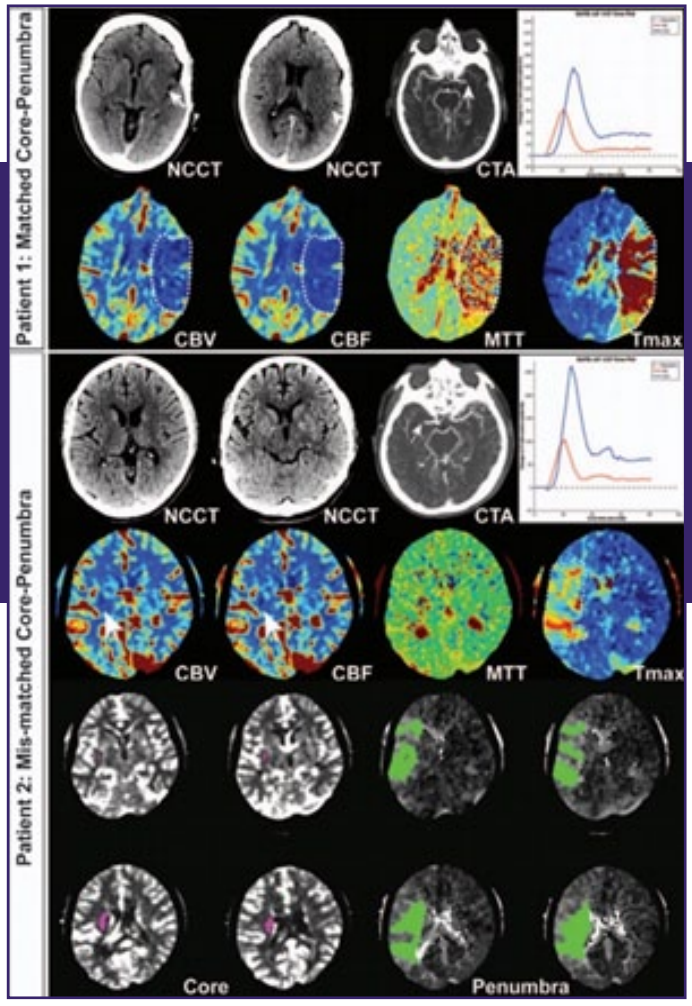
He joins our department in the clinician/scientist track to expand our epilepsy and general pediatric neurological surgery access both at SCH and our outreach clinics. In addition, Jason will focus his investigative career in clinical translational research in clinical trials.

Welcome Dr. Hauptman to the University of Washington and the Neurological Surgery Department!

UW COMPREHENSIVE NEUROVASCULAR SERVICE

As is true for most of neurosurgical diagnosis and treatment, the vascular diseases of the CNS have profited greatly from modern imaging. Beyond that, innovative new therapies have improved our abilities to treat a variety of conditions both better and less invasively. While CT, MRI, and subtraction angiography allowed us to see things better, these newer therapies allow us to do much more with far less.

The Joint Commission certified **Comprehensive Stroke Center** at Harborview, and **TeleStroke Program** offer 24 hour a day, year round consultation with outlying hospitals for the evaluation and treatment of all varieties of cerebrovascular disease. Under the overall direction of neurologist **Dr. David Tirschwell**, the program also includes neuroradiology and neurosurgical faculty, plus a broad group of collaborative services and providers. Below are images that exemplify patterns of advance imaging for ischemic stroke patients, and potential treatments.



Patient 1 has a completed stroke. The left MCA is occluded and the territory is already completely infarcted (the cerebral blood flow reduction matches the increased mean transit time). Patient 2 has a small area of completed stroke (the white arrows on CBF and CBV and the purple area on the lower two rows) and a large area of 'at-risk' tissue, or penumbra (green areas on lower two rows), that could be prevented from becoming stroke by endovascular thrombectomy.

Neurology currently partners with 6 outside hospitals for telephone based telestroke services now actively migrating to a live, 2 way, audio-visual telestroke consultation. The goal is to have 6 partners with this new system by July 2018.

A new EMS triage algorithm for acute stroke being used in King County has further impacted the interventionalists. If paramedics find a patient with acute severe stroke symptoms less than 6 hours in duration (increasing the odds of there being a large vessel occlusion), they are empowered to bring the patient directly to an endovascular stroke instead of to the most local hospital that can give IV tPA. This has led to a more than doubling the HMC acute ischemic stroke endovascular interventions and tripling the use of IV tPA.

Finally, in other stroke news, the industry funded DAWN trial reported in May showed a large benefit of endovascular therapy in a time window extended out as long as 24 hours since last known normal based on advanced analysis of CT perfusion imaging.

(continued on page 3)

(continued from page 2)

Another NIH funded trial, DEFUSE 3, was recently stopped early for overwhelming likelihood of benefit which also used CT perfusion to treat in an extended time window. The Comprehensive Stroke Center at HMC is using these preliminary results to justify doing such CT perfusion imaging out to 24 hours in the hope of being able to improve outcomes for select patients.

In addition to treating strokes, at HMC we evaluate over 350 ruptured and unruptured cerebral aneurysms every year. For those aneurysms that have ruptured, we provide both endovascular and microsurgical treatment, including endovascular coils, stents, flow diversion (e.g. Pipeline Endovascular Device), as well as microsurgical clipping and bypasses for complex aneurysms. Following treatment, patients are comanaged by our excellent Neuro ICU service under the leadership of Dr. Abhijit Lele. Such collaboration is important for the prevention and treatment of complications related to the subarachnoid hemorrhage, such as vasospasm, hydrocephalus, and other routine problems that present in the immediate postoperative period.

The best service we can provide for incidentally discovered unruptured aneurysms is to determine which one needs treatment and which to watch. In addition to the patient's age, important characteristics of the aneurysms such as size, irregularity, and location, as well as genetics, history of prior ruptured aneurysms, and the patient's preference help guide therapy.

Brain and spinal arteriovenous malformations (AVM) and dural arteriovenous fistulae are now also amenable to more precise treatments. Our team provides comprehensive intensive care, endovascular management, microsurgery, and radiosurgery by Gamma Knife. The best option in a specific case is discussed at our monthly AVM conference under the leadership of **Drs. Louis Kim** and **Jason Rockhill**.

Bypass Surgery for Moyamoya disease and brain ischemia is another area of interest. We evaluate about 70 patients a year with brain ischemic lesions, with Moyamoya disease, Moyamoya syndrome, or other occlusive vascular disease. Some are considered for bypass procedures, and some for endovascular stenting under research studies.

There are many areas of active cerebrovascular research throughout the University of Washington, including pre-clinical, translational and clinical trials. Areas of focus include vessel wall imaging to determine the rupture risk of intracranial aneurysms; translational study of aneurysm computational fluid dynamics to predict treatment outcome; and device trials to further the treatment of aneurysms, ischemic stroke and brain hemorrhage to name a few.

NEW UW FELLOWS

PEDIATRIC FELLOW

While all of us at UW know and admire **Dr. Peter Chiarelli**, some of the readers of this newsletter may not know about his remarkable accomplishments. Peter graduated *summa cum laude* from Pomona College in 2003. He spent the next three years as a Rhodes Scholar at Oxford, and earned a Ph.D. for his thesis titled *Investigation of Neurovascular Coupling using Functional MRI*. In 2010, he graduated from medical school in the combined Harvard-MIT program. Peter was a resident in our department, finishing in June 2017, and will be the Pediatric Fellow at Seattle Children's Hospital for this coming academic year.

Peter already has 2 patents, 4 book chapters and 29 referred journal articles published. The majority of his recent work is concerned with nanoparticles. He is married and has two children. He can also play the guitar and the piano, but he cannot leap buildings in a single bound.

NEUROTRAUMA FELLOW

Dr. Aziz Alali graduated from King Saud University with an M.B.B.S. in 2006. He then earned a PhD in Clinical Epidemiology and Health Care Research from the University of Toronto before he trained in Neurological Surgery at the University of Ottawa, finishing in 2016. He was also trained in Critical Care Medicine, again at the University of Toronto. Aziz won a five year grant from the Canadian Institutes for Health Research as a co-investigator studying extubation in the neurologically impaired. His 14 publications and 17 presentations are concerned mainly with TBI. In 2015 he won the Benoit Award for excellence in resident teaching given by the University of Ottawa.

CEREBROVASCULAR/SKULL BASE FELLOW

It is a little hard to know where to start listing **Dr. Sabareesh Natarajan's** accomplishments. At the Madurai Medical College he won honors in anatomy, microbiology, pharmacology and surgery. Before that he won first prize in the Einstein Club National Physics Quiz (1994), and the National Mathematics Club of India first prize in 1993. He was a resident in General Surgery at the Institute of Medical Education and Research in India, a resident in Neurosurgery at the University of Buffalo, and then an Endovascular Fellow, also at Buffalo. He won the 2010 Cushing Fellowship awarded by the CNS. He has published 77 peer reviewed papers on a variety of topics, and 27 book chapters.

We now welcome Sabareesh to the University of Washington for the year.

THE MODERN TECHNOLOGY OF CONCUSSION

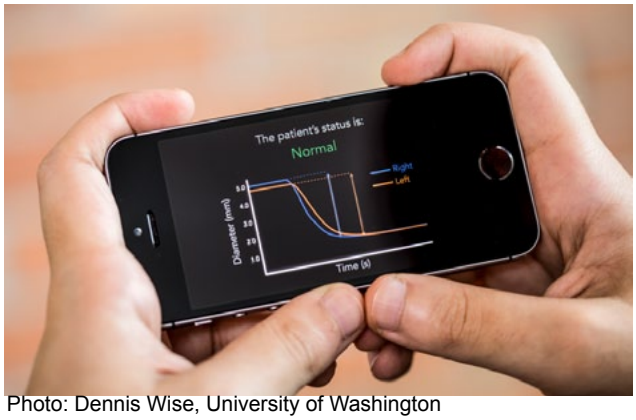


Photo: Dennis Wise, University of Washington


Photo: Dennis Wise, University of Washington

University of Washington researchers are developing the first smartphone app capable of objectively detecting concussion and other traumatic brain injuries in the field: on the sidelines of a sports game, on a battlefield or in the home of an elderly person prone to falls.

PupilScreen (pictured, top photo) can detect changes in a pupil's response to light using a smartphone's video camera and deep learning tools, a type of artificial intelligence, that can quantify changes imperceptible to the human eye.

Neurosurgery R-5 **Lynn McGrath, MD** (pictured, bottom photo, left) uses the new smartphone app to evaluate the pupillary light reflex on the sidelines in order to insure safe return to play. "Having an objective measure that a coach or parent or anyone on the sidelines of a game could use to screen for concussion would truly be a game-changer," said Shwetak Patel, the Washington Research Foundation Endowed Professor of Computer Science & Engineering and of Electrical Engineering at the UW. "Right now the best screening protocols we have are still subjective, and a player who really wants to get back on the field can find ways to game the system."

INTRODUCING NEW STAFF

We are pleased to welcome Ellie Thorstad as the new Program Operations Specialist. She will be responsible for Grand Rounds, medical student clerkships, Summer Program, Montlake Cut and departmental events. In 2014 Ellie moved to Seattle from Minneapolis where she attended the University of Minnesota. For the past two years she has worked for UW Professional & Continuing Education in Operations and Student Support. She also has experience in the nonprofit sector, where she managed programs for a youth leadership organization. Ellie lives in Eastlake with her partner (Aric) and cat (Frank). She is currently pursuing a Master's degree in Public Administration through Penn State University, and in her remaining free time, she enjoys bike rides, cross-stitching, and live music.

TEN YEARS OF THE NEUROLOGICAL SURGERY SUMMER PROGRAM

The Neurological Sumer Summer Student Program began in 2008, so this year celebrates its 10th anniversary and second year of NIH sponsorship. Our Program Mission is to inspire young students in following their interests into neuro-STEM careers by gaining direct experience with clinical and translational neuroscience.

Since its inception, the program has grown from an initial class of 4 self-referred local students to a national enterprise with some 1000 students interested in applying annually for one of 12 spaces available in our labs. Their experiences include working with a wide range of clinicians, researchers and laboratories at Harborview, UWMC, SCH and SCRI. There is substantial faculty and staff involvement supporting the 8-week lab placement along with OR shadowing and HMC Rounds, Grand Rounds, Friday Seminars, social events and end-of-session presentations where students share their research accomplishments for the summer. Simply reviewing the applications involves a team of 14 program mentors and supporters selecting finalists and alternates from amongst hundreds of highly qualified national applicants.

By the numbers, in 2017 we had applicants from 193 schools and 44 states and Puerto Rico. Over the past 10 years we have hosted 113 students from 67 different schools including 10 Rainier Scholars. Students have had 29 different faculty mentors, 30 different summer Friday Seminar speakers and 16 clinical faculty have been involved with OR shadowing and rounds. Applications for the class of 2018 open November 1, 2017 – details will be posted on the **Neurological Surgery Summer Student Program website**.

The Neurological Surgery Summer Student Program Class of 2017
was supported by generous Private Donors and
NIH R25 NS095377 – R.G. Ellenbogen, MD, FACS, PI

NIH NINDS Summer Research Experience in Translational Neuroscience and Neurological Surgery

DEPARTMENT OF NEW BABIES

PA Catherine Green and her husband Nes welcome their first child, a daughter, Taya Adaleen Ignacio Born May 18, 2017 at 6lbs 2.5oz, 19 inches long. She seems to be a fussy little girl.

Assistant Professor Anoop and Monica Patel, also a physician, welcomed Krish Prem Patel into the world on Saturday, August 5th at 11:15am. Krish weighed a very health 7 lbs, 4oz at birth. Anoop reports that both mom and baby are doing very well! Krish has been enrolled at Harvard.

PA Young Cho and his wife Jessica Tsukamoto announce the birth of their first child, also a daughter Kaila Alina Sang Cho. She was born on September 2, 2017 at 6lbs 15oz, 20.5 inches long.

Chelsea Richardson and her husband, Jarrod, welcomed Chandler Richardson to the world on September 16th at 7:28pm. He was 7lb13oz and 21in. They are all thankful for the warm welcome from the department!

PUZZLER

Dr. Minku Chowdhary
Director, Neurosurgery
Overlake Hospital

FALL EDITION QUESTION

Time grabbers control a key aspect of your life. One of the men who discovered this is related to a German and Japanese duo who discovered another “rhythm machine.” Who is the scientist in question?

We remain eager to publish stories and photos about all aspects and activities of the Department. Please share your memories, ideas and suggestions for stories and news items that expand our common ground. Please contact us at these email addresses:

Editor-in-Chief, Richard G. Ellenbogen, MD, FACS
rge@uw.edu

Editor, Richard Rapport, MD
rappor@uw.edu

Associate Editor, James Pridgeon, MHA
pridgeon@uw.edu

Director, Jana Pettit, MBA
jmpettit@uw.edu

Publications Specialist, Ellie Thorstad
ethors@uw.edu

The Puzzler-in-Chief, Minku Chowdhary, MD