



The Montlake Cut

Summer 2017

Richard G. Ellenbogen
M.D., F.A.C.S.

A View From Puget Sound

This is a moment for the Department when we are able to welcome new members. The three splendid just minted R-1s will arrive soon for boot camp, all moving to Seattle from the east. We are also fortunate and very pleased that Anoop Patel, last year's Skull Base Fellow, will remain on our faculty as Assistant Professor. It is always a joy to welcome babies into our family and recently there have been four births. Assistant Professor Mike Levitt and his wife Julia had a baby son who has left them speechless but busy, and PA Sarah Burke and her husband, Kepa Niles, recently had their first child, a daughter. Next year's pediatric neurosurgical Fellow Peter Chiarelli and his wife Megan announce the birth of their second child, and Louis Kim and his wife Aylin just had a third baby.

A recent departure from our department was former Professor and Interim Chair Bill Kelly, who died following a long illness about six months ago. Bill was a wonderful surgeon and teacher, endlessly patient and seldom roused in the OR or on the wards.

Associate Professor Christine Mac Donald, Professor Randy Chesnut, and Professor Laligam Sekhar have all made major contributions to science within the recent past. Dr. Mac Donald continues her assault on the mechanisms and consequences of military blast injuries and TBI, and Dr. Chesnut and collaborators' recent work on TBI has been recognized in several ways as some of the most significant contributions in that arena. Laligam N. Sekhar, MD and co-authors David Straus, MD, Harley Brito da Silva, MD, Lynn McGrath, MD Michael R. Levitt, MD, Louis J. Kim, MD, Basavaraj V. Ghodke, MD, Jason K. Barber, MS published a paper entitled "Cerebral Revascularization for Aneurysms in the Flow Diverter Era" that has been selected as the Neurosurgery Top Cerebrovascular Paper of the Year.

And for the past year I have been privileged to serve as the President of the American Society of Pediatric Neurosurgeons.

Richard G. Ellenbogen, MD, FACS
Professor & Chairman

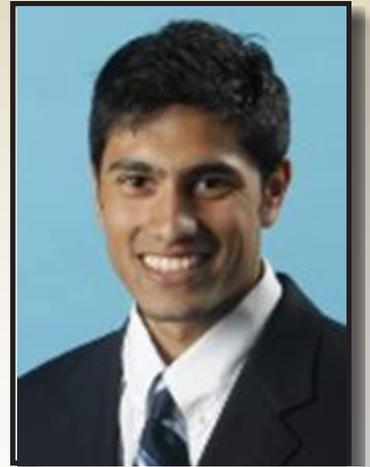
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Welcome New R-1s

Rajeev was born in Pittsburgh, PA and raised in New York, NY. He graduated from Columbia University in 2012 with a degree in biophysics. While at Columbia, Rajeev worked with Nobel laureate neuroscientist Eric Kandel sparking his interest in the brain. Rajeev continued his education in New York at the NYU School of Medicine. During medical school he developed an interest in brain tumors while working in the lab of Dimitris Placantonakis studying glioblastoma stem cells, which led to his desire to become a neurosurgeon.

At an early age, Rajeev began playing serious tennis and competed at the national and international level. He was captain of the varsity tennis team at Columbia and continued to compete during his year off between college and medical school. His other interests include golf, photography, biographical novels and the Denver Broncos [Ed. Note: He'll need to emend that last one.] Rajeev's father, Chandra Sen, is a neurosurgeon at NYU and his mother, Sharmila Sen, is an electrical engineer. Rajeev's older sister, Neena, was a professional cellist in Hong Kong and is now in law school at Fordham University. After 25 years in New York, Rajeev is thrilled to move to the west coast and begin his neurosurgery residency at UW!

Rajeev Sen



Maddie Greil



I grew up in a small college town in Western New York State. My father is a sociology professor at the university and my mother is a librarian at the college across town. After finishing high school, I attended Johns Hopkins University where I majored in neuroscience. Following college I lived in Tampa, Florida for one year where I worked in market research while applying to medical school. I attended Case Western Reserve University for medical school where I first discovered my interest in neurosurgery.

In my free time I enjoy spending time outdoors, hiking, and swimming. I took up rock climbing during medical school and it has become one of my favorite activities. I also enjoy baking and spending time with my friends and family.

New R-1's Continued..

Guilherme Barros

Guilherme Barros' story begins in Rio de Janeiro. At the spry age of two and a half, just when he was getting used to sunny stroller rides on Ipanema beach, his family resettled in northern New Jersey. His nickname was coined by his 5th grade teacher who was too scared to attempt his full name and rechristened him Guil. He studied biomedical engineering at Johns Hopkins University, and was a design team leader during his senior year. Guil and his team designed a mobile phone-integrated device for anemia screening in developing countries, dubbed HemoGlobe. The project resulted in filing a U.S. patent and winning a seed grant from the Bill and Melinda Gates Foundation to fund ongoing clinical trials in India. He also worked in a Hopkins BME wet lab studying the mechanisms of endothelial cell dysfunction during aging and atherosclerosis.



His interest in neurosurgery began during a summer in college with a cerebrovascular neurosurgeon at Columbia. As a medical student at Jefferson Medical College, he confirmed this interest in cerebrovascular and functional/epilepsy neurosurgery research projects. Guil enjoys spending his days off with family and friends, preferably in the outdoors – skiing, hiking, tennis, running, swimming, beach, or even strolling in a park with a strong cup of coffee. He also likes soccer, live music, traveling, photography, and cooking. Guil speaks fluent Portuguese and Italian, decent Spanish, and is trying to learn German. Tschüss!

Welcome New Faculty
Anoop Patel, MD
Assistant Professor of Neurological Surgery

I was born in the small Indian town of Anand in the state of Gujarat. My parents moved to England when I was a year old, and we lived there for 7 years before immigrating to the US in search of the “American dream.” As an undergrad at Yale I majored in Molecular Biophysics and Biochemistry, graduating *cum laude* in 2005. I then enrolled in the Health Sciences and Technology program at Harvard Medical School/MIT where as part of my doctoral thesis I studied stem cells in medulloblastoma, and graduated *magna cum laude* in 2009. I stayed on as a resident in Neurosurgery at Massachusetts General Hospital. My research interests there focused on intratumoral heterogeneity in glioblastoma and its relationship to therapeutic resistance.



I married my wife Monica Agarwal, a radiologist, in 2013 and we moved to the Seattle area where we are looking forward to starting our careers. In our free time we love to travel, and enjoy hiking, camping, and skiing. I love to cook, and if I wasn't a neurosurgeon I would have gone to culinary school to become a chef. Interesting facts... I've been lucky enough to travel to 28 countries. I've summited Mt. Kilimanjaro. My wife and I are both avid scuba divers, I've got over 150 dives under my belt. My favorite are shark dives (some of my favorite encounters include lemon sharks, Galapagos sharks, white tips, black tips, hammerheads and believe it or not, great whites.)

Ed. Note: Don't go diving with him.

Department of New Babies



PA Sarah Burke, one of the inpatient practitioners at HMC, and her husband Kupa Niles happily announce the birth of their first child, Theia Pearl Puanani Niles. She arrived in defiance of folk wisdom at 0522 on Friday January 13th. She was slim 6 lbs and 3 oz and measured 19 inches long.

Aylin and Louis Kim had their third child, Ziya born 1/18/17. Her proud and happy parents were joined in welcoming her by big sister Azalea, 7 and big brother Ken, 4.



Julia and Michael Levitt are proud to announce the birth of their son, Asher William Levitt! Born May 16, 2017, 9:56 pm, 8lbs 15oz and 21” long, he is big and strong and keeping them busy. His name, from the Hebrew, means “happy and fortunate,” which is exactly how his parents feel right now.

Carolina Chiarelli was born on June 20th, and weighed in at 7 pounds 11 ounces. Her father noted her OFC at 35.5 cm, well within normal. Peter’s wife Megan is a child psychiatrist who will therefore be well equipped to help Carolina’s big brother Enzo get over it.



Rich Ellenbogen is President of the ASPN



Chairman Richard Ellenbogen is the current President of The American Society of Paediatric Neurosurgeons, the Leadership Society for Paediatric Neurosurgeons in North America. Founded in 1978 by eighteen North American neurosurgeons, the membership has grown to include over 150 board-certified paediatric neurosurgeons who devote a substantial majority of their practice to the care of paediatric patients.



The purpose of the Society is to improve the neurosurgical care of children in the United States and Canada. To achieve this goal, the Society seeks to increase membership of qualified neurosurgeons, to provide leadership in the dissemination of the knowledge and the science of paediatric neurosurgery, provide guidance to the laity including paediatric neurosurgical patients and their families, and to advocate for children on issues of importance to their neurological health.

The official journal of the ASPN is [The Journal of Neurosurgery - Paediatrics](#).

Christine Mac Donald's new paper has 2500 hits in 48 hours



Associate Professor of Neurological Surgery Christine Mac Donald's paper recently published in JAMA Neurology titled "Early Clinical Predictors of 5-Year Outcome After Concussive Blast Traumatic Brain Injury" has been enormously important.

(<http://jamanetwork.com/journals/jamaneurology/fullarticle/2618936>)

Within 48 hours of publication, the paper had been read by 2,500 readers including some of the most influential news sources in the country. Dr. Mac Donald has been contacted for comment by writers and news outlets from around the world, <http://www.king5.com/news/health/study-highlights-struggle-of-soldiers-who-suffer-brain-injuries/440273102>. The paper documents the unexpected long-term effects of wartime relatively mild TBI. In a longitudinal study of 50 active duty military personnel after concussive blast injury and matched controls in Afghanistan, Dr. Mac Donald and colleagues found remarkable differences in the populations. Employing measures of neurobehavioral, neuropsychological, and mental health burden, changes at 1 and 5 years were both remarkable and progressive. Thirty-six of 50 patients (72%) who suffered concussive blast injuries had a decline in GOS-E scores between the 1 and 5 year evaluations versus only 11% of controls. These results were unanticipated and demand new treatments strategies for the survivors of these wartime injuries.

Real Science, Real Results

Claims are easy. Producing results that mean better understanding of diseases and treatments for patients is harder, but when the work is well done and meaningful that is recognized. A Trial of Intracranial Pressure Monitoring [Chesnut, Temkin, Carney et al *NEJM* (2012), 367 (26) 2471-2481] has now been cited more than 500 times. Their results are changing patient management around the world.

In addition, Randy Chesnut's first authored paper "The role of secondary brain injury in determining outcome from severe head injury" [Chesnut RM, Marshall LF, Klauber MR, et al, *J Trauma* 1993 Feb;34(2):216-22] is now the most cited paper in all the TBI literature.



Congratulations to Randy Chesnut and his collaborators.

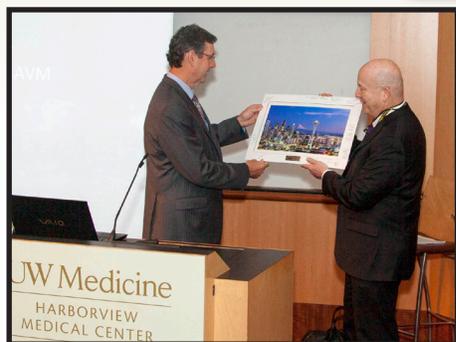
6th Annual Goodkin Lecture: Dr. Hunt Batjer

Goodkin Lecture 2017
Perspectives on Brain AVMs: 1977-2017
H. Hunt Batjer, MD, FACS



H. Hunt Batjer, MD, FACS presented the 6th ANNUAL GOODKIN LECTURE on May 31, 2017. Dr. Batjer is Lois C.A. and Darwin E. Smith Distinguished Chair in Neurological Surgery Chair, Department of Neurological Surgery University of Texas Southwestern Medical Center. He is an internationally recognized cerebrovascular surgeon specializing in ischemic and hemorrhagic strokes, as well as an authority on brain injury. He gave a comprehensive review entitled “Perspectives on Brain AVMs: 1977-2017” followed by a Resident Education Conference.

Dr. Batjer began his discussion of treatment for AVMs by noting the strengths and weakness of the current classifications systems. He stressed the importance of understanding the details of the modern imaging available in planning the operation, as well as the various adjunctive therapies that can be employed. He favors selective embolization of feeding vessels and emphasized the importance of sparing en passage vessels. Dr. Batjer also stressed finding and/or creating favorable surgical corridors to minimize damage to normal brain introduced by retraction. Finally, he noted the centrality of slow, thoughtful dissection always taking care to move away from cortex—except sometimes—when the AVM is difficult to control. He illustrated his vast experience with an array of interesting cases, accompanied by intraoperative video. The result was an insightful look back at a multi-decade career incorporating numerous innovations to address this challenging, life-threatening disease.



Neurosurgery names UW Neurological Surgery team article as Cerebrovascular Paper of the Year

RESEARCH—HUMAN—CLINICAL TRIALS

Cerebral Revascularization for Aneurysms in the Flow-Diverter Era

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Congress of Neurological Surgeons

BACKGROUND: Cerebral bypass has been an important tool in the treatment of complex intracranial aneurysms. The recent advent of flow-diverting stents (FDS) has expanded the capacity for endovascular arterial reconstruction.

OBJECTIVE: We investigated how the advent of FDS has impacted the application and outcomes of cerebral bypass in the treatment of intracranial aneurysms.

METHODS: We reviewed a consecutive series of cerebral bypasses during aneurysm surgery over the course of 10 years. FDS were in active use during the last 5 years of this series. We compared the clinical characteristics, surgical technique, and outcomes of patients who required cerebral bypass for aneurysm treatment during the preflow diversion era (PreFD) with those of the postflow diversion era (PostFD).

RESULTS: We treated 1061 aneurysms in the PreFD era (from July 2005 through June 2010) and 1348 in the PostFD era (from July 2010 through June 2015). Eighty-five PreFD patients (8%) and 45 PostFD patients (3%) were treated with cerebral bypass. PreFD patients had better baseline functional status compared to PostFD patients with average preoperative modified Rankin Scale score of 0.55 in PreFD and 1.18 in PostFD.

CONCLUSION: After the introduction of FDS, cerebral bypass was performed in a lower proportion of patients with aneurysms. Patients selected for bypass in the flow-diverter era had worse preoperative modified Rankin Scale scores indicating a greater complexity of the patients. Cerebral bypass in well-selected patients and revascularization remains an important technique in vascular neurosurgery. It is also useful as a rescue technique after failed FDS treatment of aneurysms.

KEY WORDS: Cerebral aneurysm, Flow-diverter, Pipeline, Bypass, Revascularization

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Cerebrovascular bypass of intracranial aneurysms has long been a valuable tool for the cerebrovascular surgeon, especially when endovascular treatment or direct clip reconstruction is unfeasible.^{1–6} With the recent advent of endovascular flow diversion devices such as Pipeline™ Embolization Device (Medtronic, Dublin, Ireland), SILK (Balt Extrusion, Montmorency, France), SURPASS (Styker Neurovascular, Fremont, California), and FRED (MicroVention, Tustin, California) stents, many complex cerebral aneurysms otherwise requiring cerebral bypass are now amenable to endovascular reconstruction. Flow diversion's expanding application has led some cerebrovascular surgeons to predict "flow diversion will be the death of cerebral bypasses."⁷ We hypothesized that flow diverters are used to treat some aneurysms that could have been treated by bypass techniques and thus has altered the patient population and outcomes of those who undergo cerebral bypass. We reviewed all such patients over a 10-year period, in which flow-diverting stents (FDS) were available for the last 5 years, to determine how the population of aneurysm patients undergoing bypass has changed, and the results.

ABBREVIATIONS: CT, computed tomography; EC-IC, extracranial-intracranial; FDS, flow-diverting stent; IADSA, intra-arterial digital subtraction catheter angiography; ICA, internal carotid artery; MCA, middle cerebral artery; MRI, magnetic resonance imaging; mRS, modified Rankin Scale; PED, Pipeline embolization device; PostFD, postflow diversion era; PreFD, preflow diversion era; STA, superficial temporal artery

Supplemental digital content is available for this article at neurosurgery-online.com.

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Congratulations to UW Neurological Surgery co-authors David C. Straus, MD, Harley Brito da Silva, MD (Co-First Authors), Lynn McGrath, MD, Michael R. Levitt, MD, Louis J. Kim, MD, Basavaraj V. Ghodke, MD, Jason K. Barber, MS and Laligam N. Sekhar, MD whose paper entitled "Cerebral Revascularization for Aneurysms in the Flow Diverter Era" has been selected as the Neurosurgery Top Cerebrovascular Paper of the Year. The UW study examines how the advent of flow-diverting stents has impacted the application and outcomes of cerebral bypass in the treatment of intracranial aneurysms. The competition for this honor was extremely rigorous, and involved review of all papers submitted to the Journal between June 2016 and June 2017. Dr. da Silva will present the paper at the 2017 CNS Annual Meeting in Boston in October, 2017. This is a signal honor conferred by one of the world's leading neurological surgery journals. The link to the article is here: <https://www.ncbi.nlm.nih.gov/pubmed/28383672>.

Franck Kalume received two important grant awards for epilepsy research

This is a very difficult time for basic research funding so I am pleased to have been recently successful.

I am a native of the Democratic Republic of Congo (DRC), a large country in the heart of Africa. In the mid-1990s the DRC was marked by civil unrest, protests, and wars in the push toward getting rid of Mobutu, then president for more than three decades. Under his oppressive rule, the country saw a massive deterioration of its socio-economic status leaving millions of people living in extreme poverty.

It is during this period that I moved to the US, to pursue my education. I first attended LeMoyne Owen College in Memphis, Tennessee where I obtained my bachelor's degree in Biology. It was there I discovered neuroscience during a summer research program with my Anatomy and Physiology Professor. I next joined the PhD program in the Department of Anatomy and Physiology at University of Tennessee where I trained in Neuroscience. My post-doc fellowship at the UW was in the lab of Professor William Catterall, one of the world leaders in the field of research on the structure and function of ion channels and their roles in normal and disease state.

I joined the faculty of the Department of Neurological Surgery and the CIBR at Seattle Children's Research Institute in December of 2012 as an Assistant Professor and Principal Investigator based at the Seattle Children's Research institute. I have established a research program focused on understanding the pathophysiological basis of genetic epilepsies and their co-morbid conditions. My goal is to pave the way for the developments of future drugs and therapeutic approaches for these disorders.

In the past few months, two of my research proposals were funded. One of the proposals is an NIH R01 application to investigate the role of interneurons in the development of epilepsy in a childhood form of mitochondrial disorder known as Leigh syndrome (LS). LS is the most common form of mitochondrial disorder in children and typically presents with multi-systemic clinical symptoms which result in disability and ultimately death by 3 years of age. Genetic studies have uncovered a strong association between Leigh syndrome and mutations in *Ndufs4*, the gene that encodes a mitochondrial protein centrally involved in the generation of cellular energy. We will investigate the impact of this mutation on inhibitory neurons and its contribution to the susceptibility for seizures and related sudden death in LS, hoping to provide insights into the mechanisms of epilepsy and sudden death.

The other grant came from CURE. Here I plan to investigate the efficacy of non-pharmacological manipulations of sleep and circadian rhythms in preventing seizures and sudden death in treatment-resistant epilepsy syndromes. It has been known for centuries that sleep and epilepsy share a reciprocal relationship. In the proposed work, my colleagues and I will focus on the observations that acute and chronic sleep and circadian disruptions are commonly present in people with refractory epilepsies. These disruptions are linked to several negative consequences, including cognitive impairment, emotional disorders, poor seizure control and quality of life. The group plans to correct sleep abnormality by manipulations of daily feeding and activity routines or environmental temperature, then examine the impacts of these interventions on the course of epilepsy and sudden unexpected death phenotypes using animal models of treatment-resistant epilepsy. To tackle the proposed work, I assembled a multidisciplinary team of investigators including myself, Dr. Jan Ramirez, a world expert in respiratory physiology and epilepsy, Dr. Kathleen Millen, an expert in developmental biology and mouse genetics, and Dr. Horacio De La Iglesia, an expert in sleep neurobiology.

I am very grateful for all of the enthusiastic support I have received in planning this work.

CURE is a premiere non-governmental organization that funds epilepsy research.

<http://www.cureepilepsy.org/research/>

Professor Morrison Wins New Grant

Professor Morrison recently received an NIH R21 research award for his proposal ranked in the top 2% of grants reviewed by the NIH Neural Oxidative Metabolism Study Section. His research proposal concerns recently identified neuron-specific isoforms of the Bax-interacting factor-1 (Bif-1) protein that surprisingly promote cell survival and enhances mitochondrial integrity in neurons in sharp contrast to Bif-1 expressed in non-neuronal cells which promotes cell death in response to stress. To explore the mechanism by which neuron-specific Bif-1 isoforms enhance neuronal survival, he and his team will characterize the proteins that interact with different Bif-1 isoforms in cultured neurons and non-neuronal cells as well as in the mouse brain by mass spectrometry and other assorted biochemical techniques. These studies will provide critical information regarding Bif-1's novel function and mechanism of action in neurons. Dr. Morrison's group recently demonstrated that the neuron-specific forms of Bif-1 are selectively lost in patients with moderate and severe dementia when compared to similarly aged patients not diagnosed with dementia. Knockout of the Bif-1 protein in a mouse model of Alzheimer's disease enhanced cognitive loss and deposition of beta amyloid plaques, characteristics associated with Alzheimer's disease in humans. This work has tremendous implications for treating neurodegenerative illnesses. For example, identifying proteins that selectively interact with neuron-specific forms of Bif-1 might eventually be targeted to prevent the loss of the Bif 1 protein in Alzheimer's disease which could potentially slow progression of the disease.

Passages: Dr. William A. Kelly 1927-2016

Bill Kelly, who was the fifth resident to graduate from our program, passed away after a long illness on December 15, 2016. He was esteemed by all of the residents during his long tenure as a faculty member from 1961 until his retirement in 1990. Bill was born in Cincinnati and attended school there. He joined the Navy and after his service attended Ohio Wesleyan University receiving his B.A. in 1950. He was a graduate of University of Cincinnati College of Medicine in 1954, and served his internship in Cincinnati General Hospital. A year of General Surgery at the University of Utah in Salt Lake City and a second year at the University of Chicago preceded his Neurological Surgery Residency (1957-1961) at the University of Washington. When he completed the neurosurgery residency here, he immediately became the fourth faculty neurosurgeon, joining Drs. Ward, Foltz and Bud White. He was certified by the ABNS in 1965. Bill was revered by the residents whom he spent hours educating in the clinic, on the wards, and the operating room. He was a great teacher. He covered services at the Seattle VA Hospital and the University Hospital, and, rarely, at Harborview Medical Center. He was particularly interested in the treatment of acoustic neuromas and pituitary surgery and did the first transspenoidal approach in Washington State. Bill served as Acting Chairman of the Department of Neurological Surgery 1981-1983. He was active in the Western Neurosurgical Society and served as its president in 1980.



Dr. Kelly and his wife, Joan had two sons, Tim and Craig. Bill was devoted to all three of them and spent almost all his free time with them. Joan predeceased her husband by three years. Bill Kelly was an avid golfer and loved to hunt and fish. He befriended the local surgeon in Sitka both so that he could travel to Alaska to help take care of neurological problems and to be in the outdoors. Bill Kelly was a good man who led a full and rewarding life, bringing much pleasure to those who lived and worked with him.



Dr. Minku Chowdhary

Director, Neurosurgery
Overlake Hospital

Puzzler



New Puzzler

Question: The Sea has many mysteries. One of the toughest ones is how it relates to your saltwater aquarium. This polymorphic compound helps regulate the acidity level in your home aquarium. This year, you can “see” The Sea and its colorful changes from space. What polymorphic compounds are involved in these two processes?

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:

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