Greetings and best wishes for this new year!

While many stories are told in this newsletter — honors, promotions, recognition of our faculty by the medical school — I want to bring special attention to our residency program. On this page, you will see national recognition of our program, which is ranked fifth among neurosurgery residencies by Doximity/U.S. News & World Report. One rotation that makes our residency unique is the Ireland Rotation which was recognized recently by the U.S. ambassador to Ireland, Kevin O’Malley, and featured in the Washington University Record (see page 3). Under the leadership of Program Director Gregory Zipfel, M.D., and Associate Program Director David Limbrick, M.D., Ph.D., we also offer a R25 research training grant and an outstanding faculty research mentorship group.

It is a program of which we can all be very proud.

Ralph G. Dacey Jr., M.D.

Neurosurgery Residency Ranked No. 5 by Doximity/U.S. News

We are proud to report that the Washington University Neurosurgery Residency Program was ranked No. 5 in the Doximity/U.S. News rankings of neurosurgery residencies in the United States, moving up from the No. 6 spot in last year’s rankings.

We are honored to be included in an elite group on this list and recognize that this ascension is a reflection of the hard work of everyone in the Department, and in particular Drs. Greg Zipfel and Dave Limbrick, our faculty, and our residents.
Innovation Unit Focused on Evaluating and Improving Protocols

By Greg Barnett

Washington University neurosurgeons Albert H. Kim, M.D., Ph.D., and Ian G. Dorward, M.D., have helped plan an Innovation Unit for neurosurgical patients at Barnes-Jewish Hospital that is scheduled to open this month. The unit, located on 11300, will provide the most current evidence-based care, with a focus on continually evaluating and improving protocols.

The unit represents a convergence of ideas from the Barnes-Jewish Hospital neurosurgery team, including hospital administrators, neurosurgeons and nursing staff.

"Some people were interested in the technology, some in changing the structure of nursing, and others just wanted a way to quickly validate emerging patient care protocols," says Dr. Kim. "Dr. John Lynch, chief medical officer, and Dr. David Jacques, vice president of surgical services, were also strategic players in the formation of this unit."

Historically, neurosurgery patients were kept in a dark room with limited stimulation and visits from family and friends. Evidence now suggests that patients do better when they mobilize early, working with physical therapists to get them up and moving. In the new unit, nurses will play a greater role in early mobilization. Nurses, led by head nurse Christina Ward, RN, will look at changing their traditionally hierarchical structure and how to be more efficient in providing care.

The development of state-of-the-art best practices that would then be adopted by other hospitals also represents a new frontier in the Department of Neurosurgery’s research, which currently includes basic science and clinical outcomes research.

“We will be utilizing and trialing and creating new protocols that are not a part of the hospital,” Dr. Dorward says. “We have teams that are empowered to change their practice when people have ideas.”

The unit will also have sensors that track the movement of patients in their rooms, whether they are on the bed, standing up or in other positions in the room. Algorithms can be used to show if patients are exhibiting a pattern predicting they may fall. Sensors on the nursing unit may be used to evaluate traffic patterns for care delivery, such as medical assistants taking vitals or delivering medication. These traffic patterns could be rendered more efficient as more data come in and modifications in unit architecture and/or layout are made.

Eventually, patients may be introduced to a tablet-like guide to help them review milestones in their treatment and the expectations that come with each milestone. This navigation system would include not only their time on the Innovation Unit, but their diagnosis, preoperative preparation and recovery.

Barnes-Jewish Hospital will continue to house patients on the 20-bed neuro-intensive care unit (NICU) on 10400 and the Step-Down unit on 10500, as well as the floor units on 11500 and 11400. Both brain and spine patients will be admitted to the new unit, and patients will typically be discharged from the unit to go home. Laser therapy patients and other patients with a similar acuity would be excellent candidates for the unit, which offers slightly more intensive care than the other patient floor units.
Neurosurgical Training in Ireland Fosters Personal and Professional Growth

Through an elective rotation that began nearly 15 years ago, neurosurgery residents at Washington University School of Medicine have an opportunity to see how complex neurosurgical procedures are performed in another country with a markedly different health-care system.

The residents who participate in the six-month program travel to Dublin in their sixth year of training to work at Beaumont Hospital and, some of them, the affiliated Temple Street Children’s Hospital. The hospitals are part of an academic medical center and are major referral sites for neurosurgery cases.

Ralph Dacey Jr., M.D., the Henry G. & Edith R. Schwartz Professor and head of the Department of Neurological Surgery, said the rotation shapes residents in several ways, exposing them to different instruments and techniques in the operating room, giving them a high level of responsibility, and introducing them to a different health-care system. In Ireland, free health care is provided to the public, with higher levels of coverage for those with the lowest incomes. To cut down on waits, however, many people in Ireland pay for private health insurance.

“Functioning in a totally different system, they learn the essential elements of our specialty and what aspects of care may be of lower value,” said Dr. Dacey, who initiated the program in 2000. “They realize the strengths of our system and the strengths of alternative systems and become more prudent stewards of resources in our country. Residents also assume a high degree of responsibility on the neurosurgical service. They grow as surgeons and clinicians because of that added responsibility.”

Chester Yarbrough, M.D., chief resident in neurosurgery at Washington University, completed a rotation at Beaumont Hospital and Temple Street Children’s Hospital in 2014. Among the differences he noted was an increase in surgeries involving spina bifida. “There are many more women who give birth to babies with prenatal diagnoses of spina bifida,” explained Yarbrough, whose focus at Washington University is vascular and oncological neurosurgery. “We operated on many more such patients in Ireland than I would see in a similar time period here.”

Another difference he noted was in the treatment of craniosynostosis. In Ireland, surgery to repair the condition is only performed at the children’s hospital, where Dr. Yarbrough did the brunt of his work. There, the condition is most often repaired with a craniotomy, surgery that requires a large incision and considerable manipulation of the skull bones.

In the United States, children with craniosynostosis most often are treated with minimally invasive endoscopic techniques aimed at releasing the skull bones, followed by postoperative treatments to achieve sought-after corrections.

“Both approaches are well-supported by the evidence, and there are advantages to each,” Dr. Yarbrough said. “The telling point is how the patients look and develop years down the line.”

In his time in Ireland, Dr. Yarbrough also operated on about 30 patients with brain tumors. He found the Irish use some different instruments than are used in the U.S. He picked up a few tricks and techniques he believes will help him in cranial procedures in the future. The hospital where he worked is the only children’s hospital in the country that operates on patients with brain trauma, he said.

Washington University’s involvement in and support of the program has forged a bond between Dr. Dacey and Ireland’s top medical establishment. That working relationship contributed in 2013 to him being awarded an Honorary Fellowship of the Royal College of Surgeons in Ireland.

And in 2015, a delegation from the neurosurgery department attended a reception hosted by the U.S. ambassador to Ireland, Kevin O’Malley, a St. Louis native. Mr. O’Malley held the reception at the U.S. Ambassador’s residence in Dublin’s Phoenix Park to recognize the long-standing educational relationship between the Irish neurosurgeons and Washington University. The department’s delegation included Drs. Dacey, Gregory J. Zipfel, and David D. Limbrick Jr.

“The experiences of our residents in Dublin have a lasting impact on their lives as people and as surgeons,” Dr. Dacey said at the reception. “They learn some humility as they recognize the great skill and compassion of Ireland’s neurosurgeons, physicians, radiologists, nurses, therapists and hospital administrators.”
Scientists Find Way to Disrupt Brain Tumor Stem Cells

By Michael C. Purdy

Whether surgically removed, zapped by radiation or infiltrated by chemotherapy drugs, brain tumors often find a way to return. Their ability to regenerate can be traced to cancer stem cells that evade treatment and spur the growth of new tumor cells.

But some brain tumor stem cells may have an Achilles’ heel. The cancer stem cells’ remarkable abilities have to be maintained, and researchers at Washington University School of Medicine in St. Louis have identified a key player in that maintenance process. When the process is disrupted, so is the spread of cancer. “This discovery may help us attack the root of some of the deadliest brain tumors,” said senior author Albert H. Kim, M.D., Ph.D. “A successful brain cancer treatment will very likely require blocking the tumor stem cells’ ability to survive and replenish themselves.”

Dr. Kim studies glioblastoma, a deadly form of brain cancer that each year strikes about 18,000 people in the United States. Scientists have realized in recent years that some cancer cells in glioblastomas and other tumors are more resistant to treatment than others. Those same, more defiant cells also are much better at re-establishing cancer after treatment. “These tumor stem cells are really the kingpins of cancers — the cells that direct and drive much of the harm done by tumors,” said Dr. Kim.

Dr. Kim and his colleagues identified a protein, known as SOX2, that is active in brain tumor stem cells and in healthy stem cells in other parts of the body. The researchers found that the tumor stem cells’ ability to make SOX2 could be turned up or down via another protein, CDC20. Increasing SOX2 by boosting levels of CDC20 also increased a tumor’s ability to grow once transplanted into mice. Eliminating CDC20, meanwhile, left tumor stem cells unable to make SOX2, reducing the tumor stem cells’ ability to form tumors. “The rate of growth in some tumors lacking CDC20 dropped by 95 percent compared with tumors with more typical levels of CDC20,” Dr. Kim said.

When the scientists analyzed human tumor samples, they found that a subset of patients with glioblastomas that had the highest CDC20 levels also had the shortest periods of survival after diagnosis. Kim’s lab is exploring methods to block CDC20 in brain tumors, including RNA interference, an approach in which the production of specific proteins is blocked. That general approach is in clinical trials as a therapy for other cancers, viral infections and other illnesses.

Meet the Interns

Left to Right: Christopher Dibble, M.D., Ph.D.; Bhuvic Patel, M.D.; Jacob Greenberg, M.D.

Christopher Dibble, M.D., Ph.D., joins us from North Carolina, where he obtained his undergraduate degree from Duke University and his M.D. and Ph.D. degrees from the University of North Carolina at Chapel Hill. Dr. Dibble completed his research under the supervision of Dr. Gary L. Johnson. His dissertation focused on defining the molecular mechanism of cavernous malformation disease. In his spare time, Chris enjoys watching NCAA basketball, scuba diving, tennis, and visiting the U.S. national parks.

Jacob Greenberg, M.D., was raised in White Plains, NY, and joins us from our own Washington University, where he obtained both his undergraduate and M.D. degrees. During his time in medical school, Jacob completed a TL1 predoctoral research fellowship with Drs. Dave Limbrick and Greg Zipfel and obtained a Master of Science in Clinical Investigation degree. Jacob’s interests include running, skiing, and baking.

Bhuvic Patel, M.D. was born in Johannesburg, South Africa, and was raised in Massachusetts. He obtained his undergraduate degree from Brown University and his M.D. degree from Washington University School of Medicine. As a medical student, Bhuvic conducted research in the labs of Drs. Greg Zipfel and Colin Derdeyn. In his free time, Bhuvic enjoys tae kwon do, intramural sports, and computers and technology.
Profile on New Faculty Member:
Jennifer Strahle, M.D.

Jennifer Strahle, M.D., joined the faculty of the Department of Neurological Surgery as an instructor in July of 2015. She also is completing a pediatric neurosurgery fellowship at Washington University and St. Louis Children’s Hospital. She will join the department as an assistant professor in July 2016.

Dr. Strahle grew up in New Jersey, just outside of New York City, and attended Bates College in Lewiston, Maine. She obtained her medical degree in May of 2008 from the University of Minnesota Medical School in Minneapolis. She subsequently completed her neurosurgery residency at the University of Michigan in Ann Arbor.

Dr. Strahle’s clinic interests are in pediatric neurosurgery including spine and spine deformity, brain tumors, Chiari malformation, spinal dysraphism, and hydrocephalus. She will continue her laboratory research looking at mechanisms of hydrocephalus after neonatal intraventricular hemorrhage. Her clinical research interests are in Chiari, syrinx and scoliosis in the pediatric population.

Honors & Awards

- The Neurosurgery Clinic received the “Gemini Award” on October 30, 2015, for most improved patient satisfaction scores.

- David D. Limbrick, M.D., Ph.D., received a Distinguished Service Teaching Award on October 27, 2015, as the Washington University School of Medicine students’ nominee for the national Humanism in Medicine Award, which is presented annually by the Association of American Medical

- Eric C. Leuthardt, M.D., was one of 20 health care leaders chosen by the Aspen Institute to participate in the 2015 inaugural class of its Health Innovators Fellowship.

- On April 25, 2015, Ralph G. Dacey, Jr., M.D., the Henry G. and Edith R. Schwartz Professor and head of the Department of Neurological Surgery, received the Walter Reed Distinguished Service Award, one of the highest awards given by his alma mater, the University of Virginia School of Medicine.

Ralph G. Dacey Jr., M.D., stands with one of his medical school mentors, John Jane, M.D., receiving the Walter Reed Distinguished Service Award at Dr. Dacey’s alma mater, the University of Virginia.

Departmental Promotions

The following faculty were promoted to Professor in 2015:

- Joshua L. Dowling, M.D.
- Eric C. Leuthardt, M.D.
- Matthew D. Smyth, M.D.
- Gregory J. Zipfel, M.D.

Gavin Dunn
Siteman ACS-IRG
“The Effect of Checkpoint Blockade Immunotherapy on Malignant Glioma Immunogenicity”
01/01/15 – 12/31/15

NIH K08
“Immunobiology of Malignant Glioma”
07/01/15 – 06/30/20

Jeff Gidday
BrightFocus Foundation
“Hypoxic Conditioning for Protection in DBA/2J Glaucoma”
07/01/14 – 06/30/16

NIH R01
“Endogenous Neuroprotection in Glaucoma”
01/01/15 – 12/31/18

Albert Kim
Meningioma Mommas
“Mechanisms of Radiation Resistance in Brain Meningiomas”
06/01/15 – 05/31/16

Brain Research Foundation
“Therapeutic epigenetic reprogramming of brain cancer stem cells using microRNAs”
06/01/15 – 05/31/17

Concern Foundation
“Regulation of Brain Cancer Stem Cells by the Anaphase-Promoting Complex”
07/01/14 – 06/30/16

Ammar Hawasli
CSRS
“Patients that develop a post-operative c5 palsy will demonstrate evidence of both edema and demyelination while patients with severe or permanent deficits will have significant loss of axonal density”
09/01/14 – 08/31/15

NREF
“Resting-state brain functional magnetic resonance imaging to predict functional recovery following spinal cord injury”
07/01/15 – 06/30/16

AANS/CNS
“Resting-state brain functional magnetic resonance imaging to predict recovery following spinal cord injury”
09/01/15 – 08/31/16

David Limbrick
PCORI Subcontract with Baylor
“A randomized controlled trial of anterior versus posterior entry site for cerebrospinal fluid shunt insertion”
01/01/15 – 12/31/15

Matthew MacEwan
UM SCIRP
“Restoring Motor Activation Following Spinal Cord Injury Utilizing Regenerative Sieve Electrodes”
07/01/15 – 06/30/17

Pat McAllister
STARS
“CSF Biomarkers for More Accurate Assessments of Human and Experimental Congenital Hydrocephalus”
01/01/15 – 12/31/16

Albert Einstein College of Medicine Subcontract
“MR Elastography: A noninvasive tool for management of shunted pediatric Hydrocephalus”
12/01/14 – 03/10/17

Hydrocephalus Association
“MR Elastography: A Noninvasive Tool for Management of Shunted Pediatric Hydrocephalus”
07/01/14 – 06/30/15

Rory Murphy
AANS/CNS
“The Performance of a Chronically Implanted Macro Sieve Electrode (MSE) in Rodents with Spinal Cord Injury”
07/01/14 – 06/30/15

Zack Ray
DARPA subcontract with Transient Electronics
“An Implantable Transient Electronic Nerve Stimulation Device based on Transient Electronics”
11/18/14 – 02/17/17

DARPA (PI: Moran)
“Development of a macro-sieve interface for chronic communication in the primate peripheral nervous system”
03/31/15 – 03/31/18

Department of Defense
“Nerve Transfers for Improved Hand Function following Cervical Spinal Cord Injury”
08/15/15 – 08/14/19

Greg Zipfel
NIH R01
“Translating Endogenous Vascular Protective Cascades into Therapy for Aneurysmal Subarachnoid Hemorrhage”
09/01/15 – 08/30/20

NIH R25
“Washington University Neurosurgery Resident Research Education Program”
09/30/15 – 06/30/20

Source: Toni Kozemski (Awards by PI)
Publications (June - September 2015)


Publications cont.


Publications cont.


**National & International Presentations**  
(June - September 2015)


Zipfel, GJ. (2015, June). *Building a career as an academic neurosurgeon – lessons learned.* Graduation Ceremony, Department of Neurological Surgery, Northwestern University Medical School, Chicago, IL.

“He was a person who was just revered by the residents who he trained.”

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Personal News

Drs. Ashwin Kamath and Ramya Kanukollu were married on Saturday, July 25, 2015 in Basking Ridge, New Jersey.

Drs. Jennifer Strahle and Andrew Odden welcomed their second child, daughter Ellery, on March 18, 2015 (pictured here with big sister Quinn).

Drs. Ammar and Jennifer Hawasli welcomed their first child, son Adam, on January 5, 2016.

Drs. Ammar and Jennifer Hawasli welcomed their first child, son Adam, on January 5, 2016.

Dr. Chester Yarbrough and Mrs. Courtney Yarbrough welcomed their third child, daughter Sienna Maeve, on March 9, 2015.

Drs. Jennifer Strahle and Andrew Odden welcomed their second child, daughter Ellery, on March 18, 2015 (pictured here with big sister Quinn).
New Department of Neurosurgery Staff

Breana Brunk, MA – Dr. Santiago
Sophie Church – Residency Program Coordinator
Mevlida Hodzic – Scheduling
Linda Koester – Clinical Research Coordinator for Dr. Dorward
Elvisa Kurtovic, NP – Dr. Chicoine and Dr. Kim
Alaina Landstrom, BSN, RN – Clinical Research Coordinator for Dr. Ray
Michelle Reitz, NP – Dr. Wright
Brigette Vaughn – Coding

Upcoming Events
- January 30, 2016
  10th Annual Research Symposium
- March 19, 2016
  Resident Skull Base Course
- April 30—May 4, 2016
  AANS Meeting
- May 18, 2016
  Annual Park Lecture
- May 19, 2016
  SpineLive! Course
- June 17, 2016
  Chief Party
- July 1, 2016
  Start of New Academic Year

Neurosurgery Frontiers highlights the professional and personal accomplishments of the faculty and residents of the Department of Neurological Surgery at Washington University School of Medicine. Faculty and residents are encouraged to submit their updates to the Neurosurgery Residency Coordinator, Sophie Church (churchs@wudosis.wustl.edu) for inclusion in the newsletter.

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