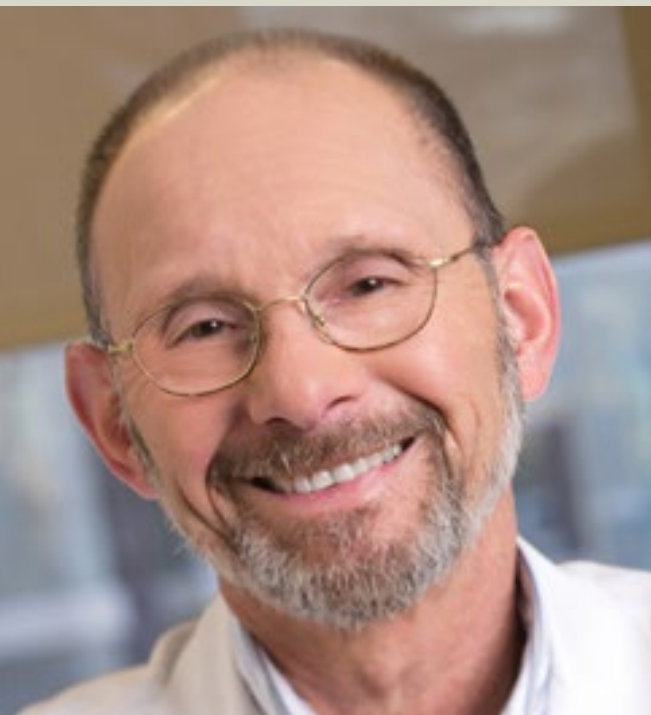




Neurosurgery

NEUROSURGERY NOW



WHAT'S INSIDE?

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A Commitment to Innovation

The Department of Neurosurgery at Stanford University is committed to training a diverse group of translational scientists. Starting with our students, residents, and interns, we focus on building a sustainable scientific and clinical community that will advance the field of neurosurgery and help improve and enhance the lives of our patients. This issue highlights some of our best and brightest.

Visit our website:
<http://neurosurgery.stanford.edu>



Faculty Spotlight



Congratulations to Dr. Ivan Soltesz.

Recently Appointed
James R. Doty Professor
in Neurosurgery and
Neurosciences, Professor of
Neurosurgery and Neurology

Ivan Soltesz, PhD, was one of five Stanford Medicine faculty members to receive endowed professorships this summer. Dr. Soltesz was appointed the James R. Doty Professor in Neurosurgery and Neurosciences, effective June 11.

The professorship was established with a gift from Doty, MD, professor of neurosurgery at Stanford and director of the Center for Compassion and Altruism Research and Education.

Dr. Soltesz's research focuses on the function and dysfunction of neuronal networks, and the mechanisms of circuit dysfunction in epilepsy. He has developed experimental methods for the control of epilepsy.

Postdoctoral fellows and graduate students in the lab employ a variety of cutting-edge experimental and computational modeling techniques to understand normal and epilepsy-related plasticity in neuronal networks. The techniques include paired patch clamp recordings from immunocytochemically identified neurons from rodent hippocampal slices, combined with powerful spinning-disk imaging and biologically realistic large-scale computational modeling methods.

JAMA Neurology

NEUROELECTRONICS AND BIOOPTICS: CLOSED-LOOP TECHNOLOGIES IN NEUROLOGICAL DISORDERS.

Brain-implanted devices are no longer a futuristic idea. Traditionally, therapies for most neurological disorders are adjusted based on changes in clinical symptoms and diagnostic measures observed over time. These therapies are commonly pharmacological or surgical, requiring continuous or irreversible treatment regimens that cannot respond rapidly to fluctuations of symptoms or isolated episodes of dysfunction. In contrast, closed-loop systems provide intervention only when needed by detecting abnormal neurological signals and modulating them with instantaneous feedback. Closed-loop systems have been applied to several neurological conditions (most notably epilepsy and movement disorders), but widespread use is limited by conceptual and technical challenges. Herein, the investigators discuss how advances in experimental closed-loop systems hold promise for improved clinical benefit in patients with neurological disorders.

[Read the full article.](#)

RECOGNIZED FOR EXCELLENCE

Dr. Soltesz was named recipient of the 2009 Michael Prize, one of the most highly regarded international awards for biomedical research on epilepsy. Soltesz's work focuses on the factors causing epileptic seizures resulting from head trauma in adults and early febrile seizures in infants.

[LEARN MORE ABOUT DR. SOLTESZ HERE.](#)

PUBLICATIONS

Click on the below titles for abstracts and more details.

[A Master Plan for the Epilepsies? Toward a General Theory of Seizure Dynamics.](#)
Epilepsy Currents

[Optogenetics: 10 years after ChR2 in neurons-views from the community.](#)
Nature Neuroscience

[Multiple Forms of Endocannabinoid and Endovanilloid Signaling Regulate the Tonic Control of GABA Release.](#)
The Journal of Neuroscience

[Future of seizure prediction and intervention: closing the loop.](#)
Journal of Clinical Neurophysiology

[Weeding out bad waves: towards selective cannabinoid circuit control in epilepsy.](#)
Nature Reviews Neuroscience

[In vivo evaluation of the dentate gate theory in epilepsy.](#)
The Journal of Physiology

[Beyond the hammer and the scalpel: selective circuit control for the epilepsies.](#)
Nature Neuroscience

RESIDENT SPOTLIGHT: MEET ONE OF OUR CHIEFS

Terry Burns, MD, PhD Chief Neurosurgery Resident

Terry is a native of Australia, whose French horn led him somewhat unexpectedly around the world and to college in the United States. He pursued biology and biochemistry at Columbia Union College, and earned his MD and PhD degrees at the University of Minnesota where his research focused on stem cells and their behavior in the ischemic brain. Terry's most serious non-academic pursuits include French horn, nature photography and traveling. An active community member, Terry served as a volunteer physician in Haiti after the earthquake in 2010, and has previously toured with his French horn to over 20 countries, frequently on fundraising tours for local schools, orphanages and hospitals. See below some of his recent awards and honors:

- San Francisco Neurological Society - Boldrey Award for Neuroscience (2015)
- American Academy of Neurosurgery Resident Award Runner Up (2014)
- Western Neurosurgical Society – Basic Science Award (2014)
- San Francisco Neurological Society - Newman Award for Neuroscience (2014)
- Stanford Society of Physician Scholars Grant Recipient (2014)
- California Institute of Regenerative Medicine Research Fellowship (2012-2014)
- Western Neurosurgical Society - Basic Science Award (2011)

RECENT PUBLICATION

[Mouse models rarely mimic the transcriptome of human neurodegenerative diseases: A systematic bioinformatics-based critique of preclinical models.](#)

Burns TC, Li MD, Mehta S, Awad AJ, Morgan AA.

[Eur J Pharmacol. 2015 Jul 15;759:101-17. doi: 10.1016/j.ejphar.2015.03.021. Epub 2015 Mar 23.](#)

[For more of Dr. Burns' publications, click here.](#)

RESEARCH INTERESTS

- Neuro-oncology
- Microglia and the Glioma Stem Cell Microenvironment
- Neurogenesis and Radiation-induced Brain Injury
- Neuroregeneration for CNS injury and neurodegeneration

Terry's research addresses questions at the interface between neuro-oncology and neuroregeneration. His recent work has aimed to elucidate the signaling mechanisms underlying impaired neurogenesis and cognition following cranial radiation. He and his colleagues recently revealed aging-like changes in the transcriptome of brain microglia following cranial irradiation and are using a novel model of rejuvenation to discriminate neuroprotective from neuropathological microglial responses. Parallel studies employ a transgenic model of quiescent neural stem cell ablation to critically evaluate the capacity for stem cell self-renewal in vivo.

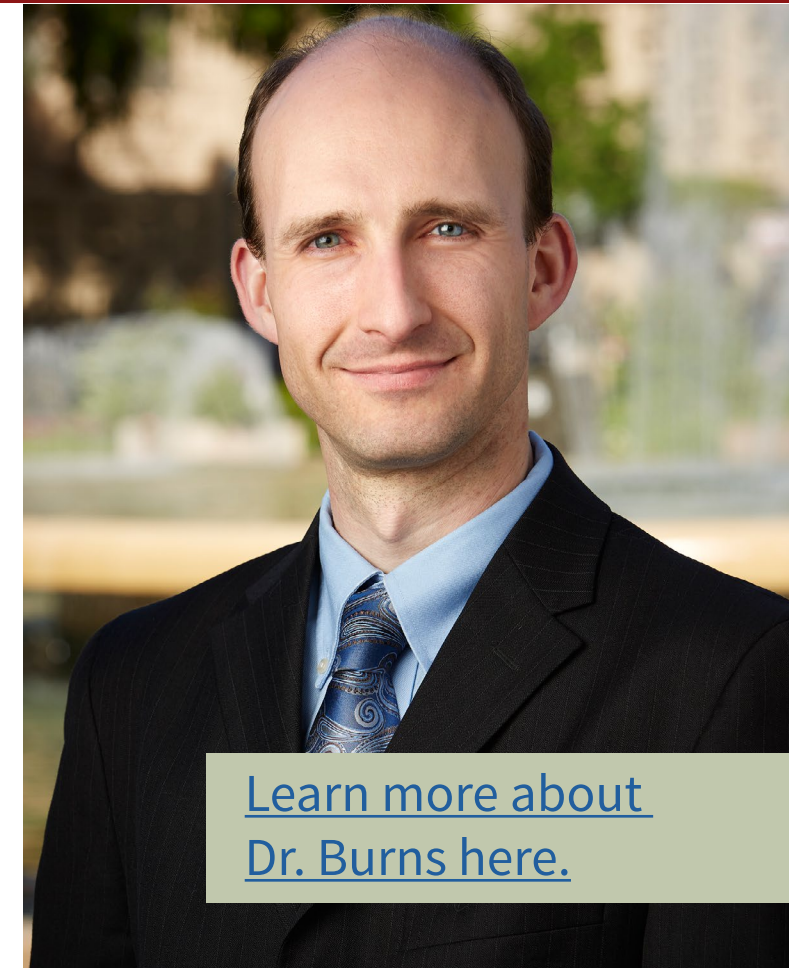
Terry is passionate about bridging the chasm between the lab and clinic to develop safe and effective therapies for human neurological diseases. To this end, he has sought to enhance the fidelity of labeling techniques for cell transplantation, characterized potentially tumorigenic epigenetic alterations that can occur in adult bone marrow-derived stem cells, and provided a systematic transcriptional critique of animal models of human neurodegenerative diseases.

“My career objective as a neuroscientist/neurosurgeon is to bridge the chasm between basic science research and patient care, translating novel neuroregenerative strategies into the clinical arena.”--Dr. Burns

AN OPPORTUNITY TO CONNECT AND LEARN MORE...

Upcoming Research Talks:

Sept 11: Western Neurosurgical Society, Kauai, HI
 Oct 9: Academy of Neurosurgery Annual Meeting, Heidelberg, Germany
 Oct 29: Congress of Neurological Surgery, New Orleans, LA
 Nov 22: Society of Neuro-oncology, San Antonio, TX



[Learn more about Dr. Burns here.](#)

RISING STARS, A STUDENT SPOTLIGHT

Meet Shrey Desai



“Before, we had to manually record every action,” said Desai. “With my program, the cylinder test is not only more accurate, but incredibly efficient.”

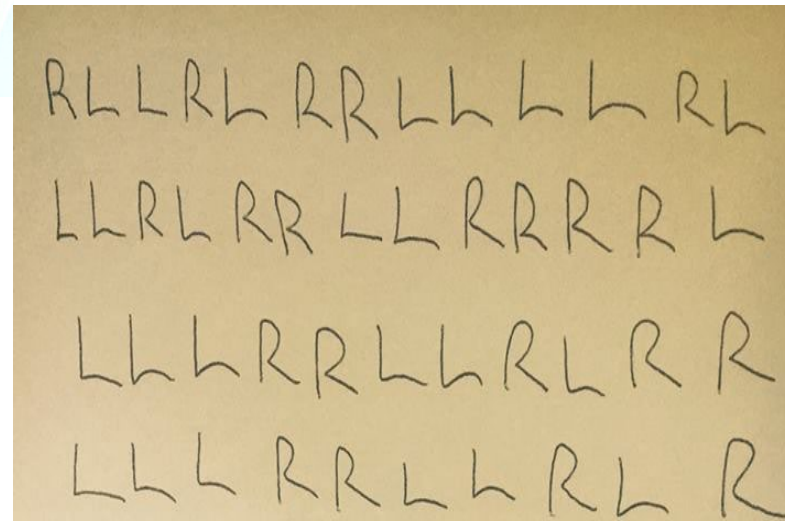
The program, PAW, which Desai is preparing for public download, increases productivity by enabling researchers to simply click “right” or “left” while administering the test. The program also calculates results and can export reports in numerous formats.

Lab members were impressed with Desai’s work. His supervisor, Lab Manager, Dr. Vanessa Doulames, praised Desai:

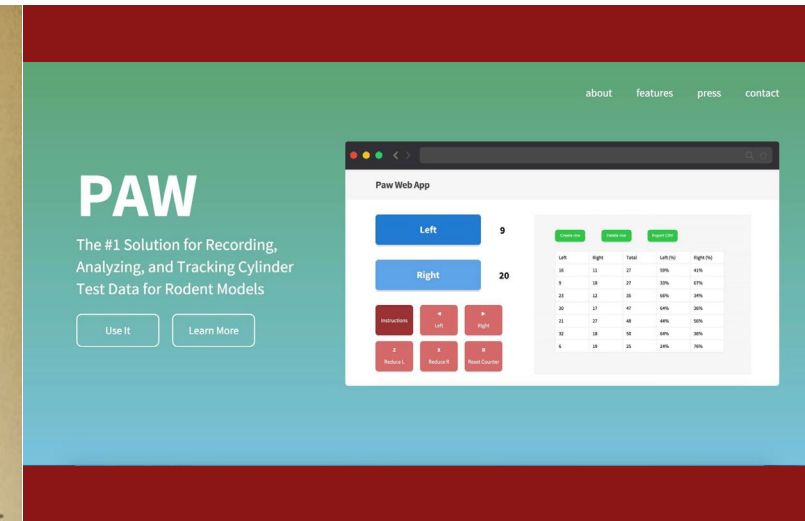
“He has been so valuable. Aside from his other tasks, Shrey made the time to do a ton of tissue processing from start to finish. So helpful.”

Desai plans to apply to Stanford’s Computer Science program and hopes to return for more training in the lab next summer.

A LASTING IMPACT



Documenting the cylinder test prior to Desai’s program.



Documenting the cylinder test with Desai’s program.

Students are the emerging leaders of tomorrow and our department has a commitment to their learning and development. Shrey Desai, a local high school senior applied for a position in Dr. Giles Plant’s lab this past May. With a long-standing interest in neuroscience, Desai was excited about the potential opportunities at Stanford. With his previous experience in a lab at the University of California, Berkeley, Desai was confident he could contribute to the efforts at Stanford. After a successful interview, he started his internship in the lab in early July. In his two months on campus, Desai was a major contributor. He was involved in behavioral testing and assisted in administering both the cylinder and cad walk tests. Desai also completed image processing and biostatistical tasks. He generated scripts that allow fellow researchers to cycle through data in a much more streamlined process.

In addition to his required duties, Desai developed, from scratch, a computer program that drastically improves the cylinder test.



[Dr. Giles Plant](#)
[Learn more about the ongoing research in the Plant lab.](#)

EMERGING RESEARCH

[Aging-like changes in the transcriptome of irradiated microglia.](#)

Glia

Li MD, Burns TC, Kumar S, Morgan AA, Sloan SA, Palmer TD.

In this study, researchers provide the first comprehensive transcriptional profile of irradiated microglia.

[Craniotomy for Resection of Meningioma: An Age Stratified Analysis of the MarketScan Longitudinal Database.](#)

World Neurosurgery

Connolly ID, Cole T, Veeravagu A, Popat R, Ratliff J, Li G.

Here, scientists sought to describe complications following resection for meningioma utilizing longitudinal administrative data, which has recently shown to be superior to nonlongitudinal administrative data.

[Assessment of brain-machine interfaces from the perspective of people with paralysis.](#)

Journal of Neural Engineering

Blabe CH, Gilja V, Chestek CA, Shenoy KV, Anderson KD, Henderson JM.

Assessing end-user preferences is an essential prerequisite to the design and implementation of any assistive technology. The results of this survey suggest that people with tetraplegia would adopt an unobtrusive, autonomous BMI system for both restoration of upper extremity function and control of external devices such as communication interfaces

[Novel Stroke Therapeutics: Unraveling Stroke Pathophysiology and Its Impact on Clinical Treatments.](#)

Neuron

George PM, Steinberg GK.

This review highlights several important mechanisms of stroke injury and describes emerging therapies aimed at improving clinical outcomes.

[Resident away rotations allow adaptive neurosurgical training.](#)

Journal of Neurosurgery

Gephart MH, Derstine P, Oyesiku NM, Grady MS, Burchiel K, Batjer HH, Popp AJ, Barbaro NM.

Here, researchers sought to evaluate off-site rotations to better understand the changing demographics and needs of resident education. This would also allow prospective monitoring of modifications to the neurosurgery training landscape. Investigators completed a survey of neurosurgery program directors and query of data from the Accreditation Council of Graduate Medical Education to characterize the current use of away rotations in neurosurgical education of residents.

[Repeat Courses of Stereotactic Radiosurgery \(SRS\), Deferring Whole-Brain Irradiation, for New Brain Metastases After Initial SRS.](#)

International Journal of Radiation Oncology* Biology* Physics

Shultz DB, Modlin LA, Jayachandran P, Von Eyben R, Gibbs IC, Choi CY, Chang SD, Harsh GR 4th, Li G, Adler JR, Hancock SL, Soltys SG.

In this study, researchers report the outcomes of repeat stereotactic radiosurgery (SRS), deferring whole-brain radiation therapy (WBRT), for distant intracranial recurrences and identify factors associated with prolonged overall survival (OS).

[Clavicle pain and reduction of incisional and fascial pain after posterior cervical surgery.](#)

Journal of Neurosurgery

Duetzmann S, Cole T, Senft C, Seifert V, Ratliff JK, Park J.

Incisional pain after posterior cervical spine surgery can be severe and very unpleasant to the patient. Ongoing incisional pain is one of the key disadvantages of posterior over anterior surgical approaches to the cervical spine. It prolongs hospital stays and delays return to work. In this study, the researchers hypothesized that incisional pain in the immediate postoperative period is caused partially by tension on the skin as well as on the deep cervical fascia and the fascia overlying the trapezius, which are usually sewn together during closure. Reduction of this tension through retraction of the shoulders should therefore reduce pain as well as the amount of pain medication used in the early postoperative period.

IN THE NEWS

Science
Translational
Medicine

Cleveland Clinic

Cleveland Spine Review: *Hands-On 2015*

Presented by Cleveland Clinic Center for Spine Health



July 14-21, 2015 | Cleveland Clinic Lutheran Hospital | Hyatt Regency at the Arcade | Cleveland, OH

LEADING THE FIELD IN PRECISION MEDICINE

CREATING NEW HOPE FOR A DEADLY DIAGNOSIS.

Despite being the most common and aggressive form of brain cancer, glioblastoma remains uniformly fatal. While the median survival is one year for patients enrolled in clinical trials, the reality is much worse in population studies. The Department of Neurosurgery at Stanford is committed to researching glioblastoma and moving to clinic potential treatment options for patients.

[Dr. Achal Achrol, Chief Neurosurgery Resident](#); [Dr. Griffith R. Harsh IV, Vice Chairman of the Department of Neurosurgery](#); and [Dr. Steven Chang, Robert C. and Jeannette Powell Neurosciences Professor](#) have led efforts to characterize individual patient tumors on the basis of their specific genetic features. Using these data, Drs. Achrol, Harsh, and Chang are developing new precision medicine protocols for the treatment of these tumors on the basis of patient-specific susceptibilities. In a recent trial, the team used magnetic resonance imaging to look at solitary, unilateral tumors from 121 glioblastoma patients and then generated nearly 400 unique image features that could be used to describe each tumor.

In the past, clinical trials followed a stereotyped sequence: take a group of people, treat them all with one therapy, and compare the averaged results of that group overall using some summary statistics. These trials result in oversights of relevant data indicating therapies that may be effective in specific subsets of patients.

"The first step in moving past the old population-level trials (the one-therapy-fits-all approach) is to understand how individual patients are different in the factors that shape how they respond to particular treatments," said Dr. Achrol. *"The next step is to select patients individually on the basis of these factors for targeted treatments to which they are most likely to respond."*

The team's work was recently published in Science Translational Medicine. [Click here to access the article.](#) ["Quantitative Neuroimaging Features Identify Glioblastoma Subtypes with Distinct Molecular Pathway Activities and Therapeutic Targets."](#)

Precision Medicine is critical to the future of neurosurgery. In January, US President Barack Obama announced a US \$215-million national Precision Medicine Initiative to further support the development of this new paradigm of care and translational research.

Stanford Neurosurgery is a leader in the field. For his initiatives in precision medicine for glioblastoma, Dr. Achrol was awarded the prestigious Mahaley Award of the Congress of Neurological Surgeons and National Brain Tumor Society, which was created to annually recognize the best clinical research in neuro-oncology.

[Learn more about Precision Medicine at Stanford Neurosurgery.](#)



This July, Dr. Suzanne Tharin served as a guest faculty member for the *Cleveland Spine Review: Hands-On 2015*. The comprehensive course included time in the cadaver laboratory, didactic sessions, and open discussions. The sessions were focused on the fundamentals of spine surgery, particularly biomechanical considerations, and the surgery decision-making process.

Through intensive, hands-on sessions utilizing cadavers, participants studied surgical techniques and strategies for a range of procedures including occipitocervical, cervical, thoracic, and lumbar fixation techniques. Com-

plex surgical exposures in all regions of the spine were emphasized.

Dr. Tharin, along with other experienced guest faculty, examined the multiple adjuncts to surgery, including soft tissue and bone retractors and distractors, minimally invasive surgical techniques, spinal implants (from multiple vendors), and dissection tools.

After completing the Cleveland Spine Review program, participants received the knowledge necessary to use problem-based decision-making to develop logical algorithms for solving complex problems, employ physiological and surgical principles to spinal fusion and instrumentation, apply anatomic and physiologic principles to the variety of surgical approaches available to access all regions of the spine, and more.



LEARN MORE ABOUT DR. THARIN AND HER LAB HERE.

Researching strategies
to repair spinal cord injury

IN THE COMMUNITY

DID YOU KNOW? According to the Centers for Disease Control, an estimated **3.8 million** concussions occur in recreational activities per year.

The infographic features a central brain illustration with various symptoms listed around it. Symptoms include: Headache, Seeing stars, Confusion, Amnesia, Fatigue, Slurred speech, Lack of orientation, Vomiting, Mood changes, Blurred vision, Sensitivity to light, Difficulty sleeping, Nausea, Decreased reaction time, Ringing in ears, Loss of energy, Knocked out, Lack of concentration, Dizziness, Irritability, Sensitivity to noise, Reduced coordination, Inappropriate emotions, Feelings of sadness, Getting your "bell rung", and Easily distracted. The word "Concussion" is written in large letters at the bottom left. To the right is the logo for the Menlo School Community Concussion Conference 2015, featuring a brain with gears inside a circular frame.

DEEP BRAIN STIMULATION INFORMATION SESSION WITH DR. CASEY HALPERN

Have you ever considered
DEEP BRAIN STIMULATION?

The Stanford Medicine Department of Neurosurgery invites you to attend a *Deep Brain Stimulation Information Session*. The meeting is for anyone interested in this surgical treatment. **Eligible conditions include:**

PARKINSON'S ESSENTIAL TREMOR DYSTONIA

Wednesday, September 30

2-3 p.m. PST

Location: Stanford University, Main Hospital Fountain Entrance, 3rd Floor, Waiting Room Outside Neuroscience Clinic

Contact: Lawrence Cloutier, (650) 725 2184



Drs. Jamshid Ghajar and Gerry Grant spoke with parents, coaches, students, and educators at a community-based concussion conference on August 18 at Menlo School's Athletic Center. The successful event, hosted by Menlo Sports Medicine, educated participants about the latest evaluation and management techniques of mild traumatic brain injuries in youth sports. In association with [The Stanford Concussion and Brain Performance Center](#), The Brain Trauma Foundation, and The California Concussion Institute, the conference featured keynote speaker, NFL Hall of Fame quarterback, Steve Young, who spent 14 seasons with the San Francisco 49ers and Tampa Bay Buccaneers.

Access Dr. Ghajar's presentation here: ["Eye-tracking to detect concussions and guide the return to play/school decision"](#).

Access Dr. Grant's presentation here: ["Clinical exam: What to expect in the doctor's office?"](#)



PATIENT CORNER

KALI NUNES, A PATIENT SPOTLIGHT



Kali Nunes had surgery at Stanford's Lucile Packard Children's Hospital with Dr. Michael Edwards in 2009. Since her surgery, Kali is a happy and healthy five-year-old girl. Kali and her family travel several hours every year to visit Dr. Edwards.

"He really saved her life," said Kali's mom, Kelsey Radant. "He is our angel and we are just so grateful."

The above photos show (from left to right) Kali as a baby just after her surgery, and Kali and Dr. Edwards at a visit this summer.

A COMMUNITY COMES TOGETHER...

EVERY SUMMER, STANFORD MOYAMOYA PATIENTS AND THEIR FAMILIES AND CAREGIVERS COME TOGETHER FOR A PICNIC IN THE PARK. THE EVENT, ORGANIZED BY THE MACINNES FAMILY, TERESA BELL-STEPHENS, AND OTHERS, HAS CONTINUED TO GROW EVERY YEAR. THE PATIENTS SHARE STORIES AND CONNECT OVER LUNCH AND ACTIVITIES. CHECK OUT THE HIGHLIGHTS FROM THIS YEAR'S EVENT. LEARN MORE ABOUT THE [STANFORD MOYAMOYA CENTER](#).



EVENTS AND OPPORTUNITIES



The Congress of Neurological Surgeons Annual Meeting is the premier forum for exploring controversial and hot-button issues impacting the neurosurgical specialty and for learning about the most cutting-edge procedures, approaches, and technologies in the field. The 2015 meeting theme highlights the rich tradition of mentorship within our specialty and celebrates our association with Walter E. Dandy, one of the great mentors and founding fathers of neurosurgery.

Important Dates

Conference: September 26-30

Important Information

[Registration Information: https://www.cns.org/annual-meeting-2015/registration-housing.](https://www.cns.org/annual-meeting-2015/registration-housing)

[Program Information: https://www.cns.org/annual-meeting-2015/sessions-schedule.](https://www.cns.org/annual-meeting-2015/sessions-schedule)

Western Neurosurgical Society

2015 Kaua'i, Hawaiian Islands Meeting

Grand Hyatt Resort and Spa, Kaua'i, HI
September 10-13, 2015

For its 61st annual meeting, the Western returns to the Grand Hyatt Resort and Spa on the Hawaiian island of Kaua'i from September 10-13, 2015. The first visit to this lovely venue was in 2011 and the attendee feedback was so positive that a return was arranged. Direct flights to the Lihue airport on Kauai (17 miles from the resort) are available from many major airports or you can always fly to Honolulu and take the short flight to Lihue. If you've never explored this unique island then renting a car is worth the expense but if you did all that in 2011, then a shuttle from the airport to the Grand Hyatt is available but must be scheduled before arrival (<https://speedishuttle.com>).

[Calendar of Events](#)

[2015 Scientific Program](#)

[Room Reservations](#)

EVENTS AND OPPORTUNITIES

CONTINUING EDUCATION (CME's)

STANFORD HEALTH CARE PRESENTS THE 6TH ANNUAL

Breakthroughs in Neurologic Therapies:

RESTORING FUNCTION TO THE NERVOUS SYSTEM

Statement of Need

This CME activity seeks to fulfill the educational needs of healthcare professionals who manage patients with neurologic conditions. The goal of the symposium is to address identified clinical challenges, to update practitioners on latest advances and best practices in the rapidly evolving field of neuroscience, and to assist practitioners in developing strategies to apply this knowledge to the diagnosis, treatment and/or referral of patients with neurologic diseases and disorders. Lectures with question and answer sessions, panels and case discussions will afford learners the opportunity to discuss practice dilemmas with the expert faculty.


Target Audience

This course is designed for physicians who specialize in primary care, neurology, interventional radiology, neurosurgery, physical medicine and rehabilitation, neuro-oncology, internal medicine, emergency medicine, family practice as well as nurses and allied health professionals who manage patients with neurologic diseases and disorders.

November 20 – 21, 2015
Palace Hotel
San Francisco, CA

*Sponsored by the Stanford University School of Medicine
A Continuing Medical Education Conference*

[CLICK HERE TO REGISTER](#)



4TH ANNUAL
Navigating Spine Care



[CLICK HERE TO REGISTER](#)

October 17, 2015 • 8:00 AM – 4:00 PM
Hyatt Regency Monterey Hotel and Spa | 1 Old Golf Course Rd | Monterey, CA 93940

Statement of Need

This CME conference seeks to fulfill the need of primary care physicians, neurologists, orthopaedists, neurosurgeons, physiatrists, and interested allied health practitioners to improve the fund of knowledge and to increase competence in evaluating, counseling, managing and/or referring patients who present with spine complaints. The course will include lectures and question & answer discussions, along with an opportunity for panel discussion.

Target Audience

This regional course is designed to meet the educational needs of primary care practitioners, family practice physicians, internists, general neurologists, neurosurgeons, physiatrists, orthopaedists and interested nurse practitioners and physician assistants who manage patients with spine diseases and disorders.

Learning Objectives

At the conclusion of this activity, participants should be able to:

1. Optimally counsel, diagnose, manage patients with the following diseases, disorders and issues:
 - a. Scoliosis
 - b. Degenerative Scoliosis
 - c. Degenerative Disc Disease
 - d. Tumors of the Spine
2. Make appropriate, timely referrals of patients to spine specialists.
3. Order appropriate diagnostic imaging for spinal complaints.
4. Develop strategies to counsel, treat, and/or refer patients with spine conditions, taking into consideration the complex factors impacting safety and efficacy.