



Editor:

Sameer Sheth, MD, PhD, FAANS

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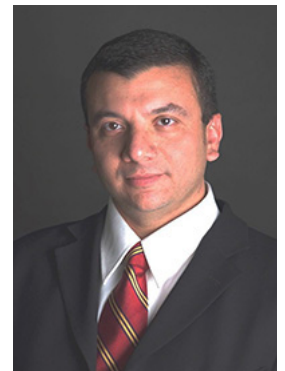
2018 AANS Annual Scientific Meeting Activities5

ASSFN.org

Message From the President

Dear Stereotactic and Functional Neurosurgery Community,

It is again with a sense of deep honor that I share my thoughts regarding our organization and field. The ASSFN continues to grow and thrive. Our membership base is strong and continues to expand, both with practicing neurosurgeons and with trainees. We continue to work for our members across a range of issues, from regulatory and reimbursement discussions with the AANS/CNS Washington Committee, to developing new training opportunities for residents and fellows and bringing forward the latest advances in clinical care and research. The invitation is always open to contact me and other members of the board with ideas for making the ASSFN more useful to your practice, research and educational efforts.



Dr. Eskandar

The apogee of our organization’s activities is the Biennial Meeting. The ASSFN meeting will be held this year, June 2-5, in Denver with the guidance of Meeting Chair Aviva Abosch, MD, PhD, FAANS, past-president of ASSFN. The scientific program covers a full range of exciting and innovative topics in our field, thanks to Scientific Program Chair Nader Pouratian, MD, PhD, FAANS, and his team, including Clement Hamani, MD; Mark Richardson, MD, PhD, FAANS; Sameer Sheth, MD, PhD, FAANS; Jennifer Sweet, MD; Cristin Welle, PhD, and local Arrangements Chair Steve Ojemann, MD, FAANS. We will all learn a great deal at the meeting and will also have a terrific time together while we’re there! On behalf of myself and the rest of the ASSFN community, I would like to thank Dr. Abosch and her team for putting together what promises to be a fantastic meeting and encourage all of you to attend.

The vibrancy of ASSFN parallels the exciting growth of stereotactic and functional neurosurgery. As practitioners, we continue to see a tremendous influx of technology into our subspecialty. Now more than ever, we have multiplicity of novel neuromodulatory approaches and new minimally invasive techniques for the treatment of movement disorders, epilepsy and pain. Moreover, new indications and improved treatments are rapidly evolving as a result of research and technological advancements .

As educators and scientists, we see an increasing number of medical students and residents interested in functional neurosurgery, because of the caliber of research, interest in understanding the brain and the desire to drive innovation. Often, these trainees are among the best of the crop. They are a precious resource and are truly the life-blood of the field. It is imperative that we continue to attract the best and brightest, that we provide them with complete and balanced training and that we

Continued on the next page ...



President's Message continued

promote their enthusiasm, creativity and passion.

Research continues to drive our field, and the time has never been better to conduct research relevant to functional neurosurgery. As just one example, the BRAIN Initiative continues to fund research relevant to circuit-based neuroscience and neuromodulation at an unprecedented rate. The number of neurosurgeon principal investigators on these grants, most of whom are in our field, has tripled in the past three years. In parallel, there is tremendous interest from our existing partners in industry and increasingly from information/technology companies. This interest is evident in the progress of artificial intelligence, deep learning, neuro-economics and brain-technology interfaces. Our field stands at a critical juncture. The concept of connections between the brain, technology and the outside world is no longer in the realm of science fiction, but is just around the corner. While this represents tremendous opportunities, it also carries a responsibility to actively engage with the process, to participate in neuroethical discussions and to lead the field in a forward-looking but responsible manner.

We are privileged to work in these exciting times in the company of such wonderful colleagues.

I look forward to seeing you at the Biennial Meeting in Denver!

Emad N. Eskandar, MD, FAANS
ASSFN President

CNS 2017 Stereotactic and Functional Neurosurgery Resident Award

The Congress of Neurological Surgeons (CNS) Resident Award in Stereotactic and Functional Neurosurgery was presented at the 2017 Annual CNS meeting to Benjamin Grannan, MD, a fourth year resident at Massachusetts General Hospital and a postdoctoral fellow in the lab of Ziv Williams, MD, FAANS.

His study — Prefrontal Neurons Modulate Motor Behavior by Targeting Distinct Mediolateral Cortical Sites — used microelectrode recordings in rhesus macaques to study the interactions between the dorsolateral prefrontal cortex, supplementary motor area and dorsal premotor areas during multi-step motor behavior.

Coherence analysis between the three sites revealed increased theta oscillatory activity between the prefrontal and premotor sites during initiation and continuation of movement, whereas discontinuation of movement was characterized by a global decrement in functional coupling. Granger causality was used to assess directionality of information flow between the sites and was found to fit an expected top-down model (prefrontal driving of medial and lateral premotor cortices) during movement initiation and continuation. However, interestingly, movement inhibition was characterized by a counter-current of flow with premotor sites tending to drive the dorsolateral prefrontal cortex. Dr. Gannan is pursuing a career in academic functional neurosurgery and is interested in studying the neural encoding of human motor and cognitive behavior. •



The Congress of Neurological Surgeons (CNS) Resident Award in Stereotactic and Functional Neurosurgery was presented at the 2017 Annual CNS meeting to Benjamin Grannan, MD. (center)

Stereotactic and Functional News & Views

In the sections below, we summarize newsworthy developments of clinical and scientific relevance to the stereotactic and functional (S&F) neurosurgery community. Included in this list are new products, milestones and industry trials, as well as notable research developments from our neurosurgical colleagues.

Movement Disorders

- Boston Scientific recently received U.S. FDA approval for the Vercise™ DBS System. The approval was based on the INTREPID study, a multi-center (23 sites, 292 patients), prospective, double-blind, randomized sham-controlled study of DBS for PD, the results of which are expected to be published soon. The system features the Vercise rechargeable IPG, which can have a battery life of at least 15 years and has the capability to independently control the amount of current delivered by each contact on the lead.
- The first study showing clinical advantages for Abbott directional deep brain stimulation over non-directional deep brain stimulation was published in *Brain Stimulation* (Rebelo et al., 2018). In particular, similar treatment effects were achieved with 31 percent less current.
- Both mitochondrial and lysosomal dysfunction have been shown to lead to loss of substantia nigra dopamine neurons in Parkinson's disease, but how these distinct processes lead to a similar clinical phenotype was not clear until this year. A group at Northwestern showed that mitochondrial oxidant stress leads to accumulation of oxidized dopamine, which in turn disrupts lysosomal function, leading to alpha-synuclein accumulation and cell loss. Importantly, the authors note that this "toxic cascade" was only detected with human dopaminergic neurons, not in animal models (Burbulla et al., *Science*, 2017).
- Patients with Parkinson's disease who suffer from comorbid psychiatric and/or behavioral symptoms are not always offered DBS surgery. However, in the EARLYSTIM cohort (a randomized trial of early surgery or continued therapy), there was a marked behavioral and psychiatric benefit for surgery over continued medical therapy. In particular, use of psychiatric medication was much less frequent in the surgery group than the medical cohort (Lhommée et al., *Lancet Neurology*, 2018).

- The mechanism of efficacy for pallidal DBS for dystonia is not fully understood. Single-pulse stimulation of the pallidum was found to generate periods of cortical plasticity in the primary motor cortex, which may contribute to the therapeutic effect (Ni et al., *Annals of Neurology*, 2018).
- A group in Spain reported a pilot study of unilateral high-intensity focused ultrasound (HIFU) subthalamotomy in ten patients for asymmetric Parkinson's disease. Side effects were mostly minor, and the UPDRS III Motor score went down by about 50 percent on the treated side (Martinez-Fernandez et al., *Lancet Neurology*, 2018).

Epilepsy

- The *New England Journal of Medicine* published the first randomized trial of epilepsy surgery in children (Dwivedi et al., 2017). The authors, who conducted their study at a large referral center in India, randomized 116 patients 1:1 to surgery or continued medical management. Seventy-seven percent of patients in the surgery group achieved seizure freedom at 12 months, compared to only 7 percent in the medical group.
- A multi-site group led by the University of Pennsylvania showed that closed-loop stimulation of lateral temporal cortex could improve memory in epilepsy patients with intracranial electrodes (Ezzyat et al., *Nature Communications*, 2018).
- The Emory group published their experience with laser ablation amygdalohippocampotomy, now the biggest in the literature (Gross et al., *Annals of Neurology*, 2018). Fifty-eight patients had a seizure-freedom rate of approximately 50 percent. Memory problems were distinctly rare (8 percent overall).

Chronic pain

- The FDA and the EU have both approved the newest Nevro IPG, the Senza II, for sale. The Senza II is smaller than the previous model and has a ten-year battery life. It is approved for head and extremity MRI up to 3T with the percutaneous leads.

Stereotactic and Functional News & Views (cont'd)

New Directions

- Sanfilippo syndrome is a devastating, uniformly fatal lysosomal storage disease for which no treatment is available. Four children in France underwent cerebellar injections of a recombinant virus that encoded the deficient enzyme, α -N-acetylglucosaminidase. In three of four children, neurocognitive decline was halted and all improved relative to the natural history of the disease (Tardieu et al., *Lancet Neurology*, 2017).
- The much-awaited, industry-sponsored BROADEN trial of DBS for depression was published last fall. Ninety patients were randomized 2:1 to active or sham stimulation (Holtzheimer et al., *Lancet Psychiatry*, 2017). About 20 percent of both groups met the pre-defined endpoint at six months and the trial was halted. However, during the open-label portion of the study, when all patients received active stimulation, approximately 50 percent of patients were responders. An ASSFN-sponsored workshop had convened during the 2016 Biennial Meeting to discuss the path forward for psychiatric neurosurgery. The proceedings paper from that workshop was recently published, which includes commentary on BROADEN as well as the field overall and future directions (Bari et al., *Journal of Neurology, Neurosurgery, and Psychiatry*, 2018).
- A single case of a patient who “woke up” from a vegetative state after VNS placement generated excitement in the mainstream media (Corazzol et al., *Current Biology*, 2017); however, the authors were subsequently criticized for not mentioning the subsequent death of the patient from pneumonia (*The Guardian*, 2017).

Research

As has been the case for the past two years, neurosurgery-led teams are having tremendous success getting funding for cutting-edge projects through the BRAIN Initiative.

- Dennis Turner, MD, FAANS, of Duke University received a collaborative UH3 grant from the NIH to study closed-loop combined STN and GPi DBS using the Medtronic PC/RC+S system. The study will test for synergy between both targets, as well as the possible benefit of biomarker-triggered closed-loop stimulation.
- Two UH3 projects were funded to study DBS for treatment-refractory depression (TRD). Sameer

Sheth, MD, PhD, FAANS, (Baylor College of Medicine, BCM), Nader Pouratian, MD, PhD, FAANS, (UCLA) and Wayne Goodman, MD (BCM Psychiatry) will use the Boston Scientific DBS system with segmented electrodes and directional current steering. They will use intracranial recordings in the form of stereo-EEG, epilepsy-style investigations to understand symptomatic networks and then use the directional capacity of the DBS system to engage them on an individualized basis. Helen Mayberg, MD, (Mt. Sinai Neurology/Neurosurgery) will use the Medtronic PC/RC+S system to develop biomarkers of TRD. Her team will optimize DBS therapy using a combination of intracranial recordings and scalp EEG as well as patient-defined white matter tractography.

- Gordon Baltuch, MD, PhD, FAANS, and scientist collaborator Joshua Gold, PhD, both at the University of Pennsylvania, received a U01 award to leverage microelectrode recording opportunities during DBS surgery to study human decision-making. Recordings in the substantial nigra pars reticulata, along with concurrent eye tracking, will provide a window into complex cognitive behavior.
- The Cedars-Sinai team of Adam Mamelak, MD, FAANS, and scientist Ueli Rutishauser, PhD, received a U01 grant to study memory formation in the human brain. Using recordings from epilepsy patients, they will investigate how memories are created, with the hope of improving treatments for patients with memory disorders.



Saturday, April 28

8:00-10:53 am

**International Symposium
Session I: Stereotactic and Functional**

Moderators: Aviva Abosch, MD, PhD, FAANS;
Emad N. Eskandar, MD, FAANS; Sameer A.
Sheth, MD, PhD, FAANS

8:00-8:05 am
Introduction
Sameer A. Sheth

8:06-8:21 am
DBS for Pain
Tipu Z. Aziz

8:22-8:37 am
**Neurosurgery for
OCD: Stimulation or
Ablation**
Ludvic Zrinzo

8:38-8:53 am
**Superolateral MFB
DBS for Depression**
Volker Coenen

8:54-9:09 am
**Surgery for Temporal
Lobe Epilepsy**
Tomislav Sajko

9:10-9:25 am
**Epilepsy Surgery in
Africa: The Moroccan
Experience**
Abdeslam El Khamlichi

9:26-9:41 am
**Individualizing
Surgery for Patients
with Spasticity**
Johannes M. N. Enslin

9:42-9:57 am
**Stereotactic and
Functional
Neurosurgery in
Developing Countries**
Samuila Sanoussi

9:58-10:13 am
**Pathological Network
in Essential Tremor
and Surgical
Implications**
Jean Regis

10:14-10:37 am
**Stereotactic and
Functional Panel/
Case Discussions**

1:00-5:00 pm

**017 Laser Thermocoagulation (LITT) –
How, When, and Why**

Director: Veronica L. Chiang, MD, FAANS

Assistant Director: Michael Schulder, MD,
FAANS

Faculty: Eric Claude Leuthardt, MD, FAANS;
Claudio Tatsui, MD, FAANS; Stephen B. Tatter,
MD, PhD, FAANS

MRI-guided Laser Thermal Ablation (MgLTA) is a developing technology with evolving indications. It is currently mostly involved mostly in the treatment of tumors and epilepsy but with possible indications in vascular and spine. It is important for neurosurgeons to understand the advantages, limitations and costs of this new technology and what needs to be studied to further develop this technology appropriately.





Sunday, April 29

7:30-11:30 am
030 Integrating Pain Management into your Neurosurgery Practice

Director: Jennifer A. Sweet, MD
Assistant Director: Steven M. Falowski, MD, FAANS
Faculty: Jason E. Pope, MD; Ashwin Viswanathan, MD, FAANS

At least 70 percent of neurosurgeons have a predominant spine practice. One way to differentiate your practice and provide your non-surgical patients other options is to offer neuromodulation and other pain procedures. In this cadaver-based course, the nuances of spinal cord stimulation placement will be presented, along with a discussion on how pain procedures bring value to one's practice.

7:30-11:30 am
033 Deep Brain Stimulation (DBS): Update and New Directions

Director: Sameer A. Sheth, MD, PhD, FAANS
Assistant Director: Sharona Ben-Haim, MD, FAANS
Faculty: Aviva Abosch, MD, PhD, FAANS; Ellen L. Air, MD, PhD, FAANS; Casey Harrison Halpern, MD; Michael G. Kaplitt, MD, PhD, FAANS; Brian H. Kopell, MD, FAANS; Paul S. Larson, MD, FAANS; Chuck Mikell, MD; John D. Rolston, MD, PhD; Joshua M. Rosenow, MD, FAANS; Donald M. Whiting, MD, FAANS

Practical aspects of surgery for the treatment of Parkinson's disease, tremor and dystonia will be presented. Emphasis will be on anatomical and physiological targeting strategies, intraoperative decision-making, troubleshooting, complication avoidance and management. Cases and intraoperative scenarios will be presented for interactive discussion between the audience and faculty.

7:30-11:30 am
036 Neuromodulatory Surgeries for Epilepsy and Beyond

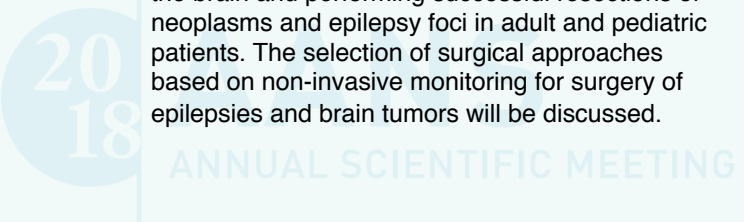
Director: Jorge Alvaro Gonzalez-Martinez, MD, PhD, FAANS
Assistant Director: Gerald A. Grant, MD, FAANS
Faculty: Aviva Abosch, MD, PhD, FAANS; Robert E. Gross, MD, PhD, FAANS; Casey Harrison Halpern, MD; Brent Randle O'Neill, MD, FAANS; Steven G. Ojemann, MD, FAANS; Jon T. Willie, MD, PhD, FAANS

Attendees will participate in a combined didactic and hands-on course that covers the fundamentals of neuromodulation for the treatment of medically-refractory epilepsy and the place of neuromodulatory techniques within the spectrum of surgical treatments for the epilepsies.

12:30-4:30 pm
041 Brain Mapping and Awake Techniques

Director: Gerald A. Grant, MD, FAANS
Assistant Director: Guy M. McKhann, II, MD, FAANS
Faculty: Nicholas M. Barbaro, MD, FAANS; Mitchel S. Berger, MD, FAANS; Hugues Duffau, MD; Jorge Alvaro Gonzalez-Martinez, MD, PhD, FAANS; Francesco Sala, MD; Nader Sanai, MD, FAANS

This course will provide an in-depth review of techniques and technologies that can be applied to identifying and working within eloquent areas of the brain and performing successful resections of neoplasms and epilepsy foci in adult and pediatric patients. The selection of surgical approaches based on non-invasive monitoring for surgery of epilepsies and brain tumors will be discussed.





Monday, April 30

7:00-9:00 am
107 New Innovations in Epilepsy Surgery

Moderator: Nicholas M. Barbaro, MD, FAANS

Panelists: P. David Adelson, MD, FAANS; P. Sarat Chandra, MD; Robert E. Gross, MD, PhD, FAANS

This seminar will focus on the surgical approaches to epilepsy that do not involve removal of tissue. Various electrical stimulation techniques will be discussed, as well as procedures currently under investigation, such as radiosurgery and cerebral cooling. More traditional non-resective techniques, such as corpus callosotomy and multiple sub-pial transection, also will be included in this comprehensive discussion.

7:00-9:00 am
109 Tumor-related Epilepsy

Moderator: Mitchel S. Berger, MD, FAANS

Panelists: Richard W. Byrne, MD, FAANS; Edward F. Chang, MD, FAANS; Jeffrey M Politsky, MD, FRCP(C)

This seminar will provide an overview of the management of tumor-related seizures and refractory epilepsy. We will discuss how to optimize seizure control during surgical resections, including the use of pre- and intraoperative electrophysiological approaches, as well as decision making resection strategies such as when to perform an amygdalohippocampectomy. The use and efficacy of pre-operative and post-operative anti-epileptic medications also will be discussed.

2:00-5:30 pm
Scientific Session III: Stereotactic and Functional Surgery

Moderators: Andre Guelman Machado, MD, PhD; Julie G. Pilitsis, MD, PhD, FAANS

7:00-9:00 am
111 Fast Tracking Patients in Neurosurgery: Protocols and Pathways for Enhanced Recovery

Moderator: Neil R. Malhotra, MD, FAANS

Panelists: Karthik Madhavan, MD; Jean-Pierre Mobasser, MD, FAANS

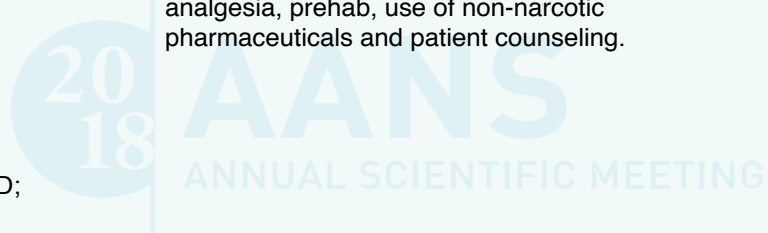
This seminar will focus on the growing need to accelerate patients through the recovery process after surgery in response to patient-driven systems of healthcare, economic pressures and the need to standardize treatment protocols. The didactic lectures will cover methods for reducing homeostatic disruption, postoperative pain management protocols and the incorporation of multi-modal team based approaches.

7:00-9:00 am
116 Peri-operative Pain Management – is Narcotic Free America Possible?

Moderator: Michael Y. Wang, MD, FAANS

Panelists: Christoph Paul Hofstetter, MD, PhD, FAANS; Praveen V. Mummaneni, MD, FAANS; Jennifer A. Sweet, MD

The national opiate crisis had led to new initiatives in reducing pain and narcotic consumption after spinal surgery. This challenging realm requires a different approach to patient care. In this Breakfast Seminar attendees will hear varying perspectives from surgeons who have successfully reduced pain through various methods, including modifications of surgical technique, regional analgesia, prehab, use of non-narcotic pharmaceuticals and patient counseling.





NEUROSURGERY

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APRIL 28-MAY 2 • NEW ORLEANS

2018 AANS ANNUAL SCIENTIFIC MEETING



Tuesday, May 01

7:00-9:00 am
204 SEEG Surgery in Pediatric Patients

Moderator: Jeffrey P. Blount, MD, FAANS

Panelists: Sanjiv Bhatia, MD, FAANS; Joshua J. Chern, MD, PhD, FAANS; Giorgio Lo Russo, MD (Italy); Matthew D. Smyth, MD, FAANS; Nitin Tandon, MD, FAANS

Stereoencephalography (SEEG) has proven itself to be an attractive alternative to grid-based strategies for invasive electrode placement in the treatment of medically resistant epilepsy. Experience with SEEG in children is still limited and this symposium will focus solely on SEEG in children. Indications, challenges unique to children and instructive cases will be presented.

7:00-9:00 am
206 Surgical Treatment of Parkinson's Disease

Moderator: Ellen L. Air, MD, PhD, FAANS

Panelists: Jonathan R. Jagid, MD, FAANS

Participants will discuss surgical targets in Deep Brain Stimulation, including a variety of technical approaches and complications.

2:00-5:30 pm
AANS/CNS Section on Stereotactic and Functional Surgery

Moderators: Jonathan P. Miller, MD, FAANS; Sameer A. Sheth, MD, PhD, FAANS

7:00-9:00 am
218 Neurosurgical Management of Intractable Pain

Moderator: Konstantin V. Slavin, MD, FAANS

Panelists: Jonathan P. Miller, MD, FAANS; Ahmed M. Raslan, MD, FAANS; Jan Vesper, MD, PhD

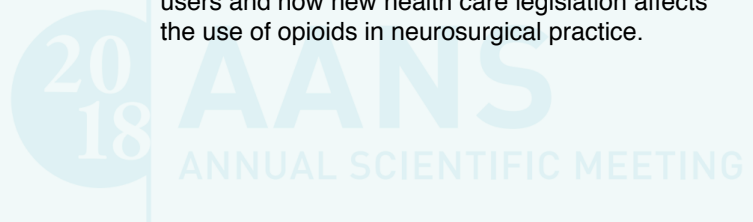
This seminar will review indications, techniques and outcomes of contemporary neurosurgical procedures for the treatment of intractable pain. Attention will be directed toward practical applications of therapies that can be used in a general neurosurgical practice.

7:00-9:00 am
219 The Use of Opioids in Neurosurgical Practice: How to be Safe, Effective and Compliant with New Prescribing Laws

Moderator: Christopher J. Winfree, MD, FAANS

Panelists: Francis Michael Ferrante, MD; Jakun Willard Ing, MD; Joshua M. Rosenow, MD, FAANS; Jason M. Schwalb, MD, FAANS

This course provides an update for any neurosurgeon, resident, fellow, nurse practitioner (NP) or physician assistant (PA) who utilizes opioids in neurosurgical practice. It includes information on the pharmacology and clinical evidence supporting opioids and related medications in neurosurgery patients, how to provide these medications safely to neurosurgical patients, even in those who are chronic opioid users and how new health care legislation affects the use of opioids in neurosurgical practice.





Wednesday, May 02

7:00-9:00 am

306 Resective Strategies for Epilepsy

Moderator: Gerald A. Grant

Panelists: William E. Bingaman Jr., MD, FAANS; Brent Randle O'Neill, MD, FAANS; Michael David Sather, MD, FAANS; Nitin Tandon, MD, FAANS

This seminar will examine the preoperative evaluation for surgery, as well as emphasize the changing description of the epileptogenic focus and how this may alter new surgical therapies.

7:00-9:00 am

307 Stem Cell Therapeutics in Neurosurgery

Moderator: Nicholas M. Boulis, MD, FAANS

Panelists: John A. Boockvar, MD, FAANS; Andrew W. Grande, MD, FAANS; Ann M. Parr, MD, PhD, FAANS; Gary K. Steinberg, MD, PhD, FAANS

Stem-cell transplantation offers a new potentially revolutionary approach to currently untreatable central nervous system diseases. Speakers will report on the scientific underpinnings, delivery mechanisms and early use of stem-cell CNS transplantation to treat human disease, as well as pragmatic and societal challenges to progress.

7:00-9:00 am

311 Emerging Indications in Neuromodulation Surgery

Moderator: Andre Guelman Machado, MD, PhD

Panelists: Kim J. Burchiel, MD, FAANS; Kelly Douglas Foote, MD, FAANS; Sameer A. Sheth, MD, PhD, FAANS

The objective of this course is to discuss the culture of safety implementation in performing these minimally invasive surgeries, as well as complication avoidance with stereotactic and functional neurosurgery. This seminar also highlights the different techniques available to manage these complications.

1:00-2:00 pm

Rapid Fire Abstracts: Neurotrauma; Pediatrics; Stereotactic and Functional

2:00-5:30 pm

AANS/CNS Section Pain

Moderators: Sharona Ben-Haim, MD; Jason M. Schwalb, MD, FAANS



American Society for Stereotactic
and Functional Neurosurgery

2018 | BIENNIAL MEETING

D E N V E R

Westin Denver Downtown • June 2-5, 2018

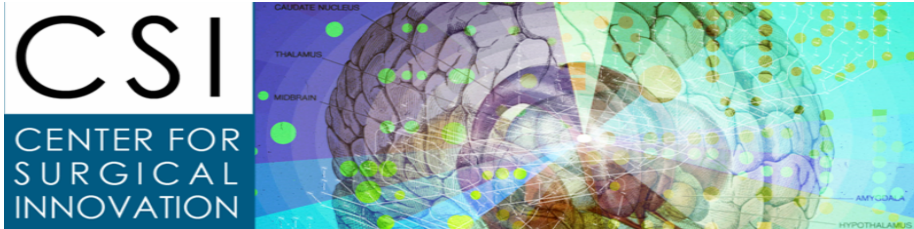


Congress of
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Surgeons

Jointly provided by the Congress of Neurological Surgeons and the
American Society for Stereotactic and Functional Neurosurgery



*The ASSFN
in association with The University of Colorado Department of Neurosurgery,
presents:*



Stereotactic and Functional Neurosurgery
Hands-on Workshop
November 9-11, 2018
Center for Surgical Innovation
Aurora, Colorado



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