

Stereotactic and Functional NEUROSURGERY NEWS



Fall 2017

AANS/CNS Section on Stereotactic and Functional Neurosurgery and American Society for Stereotactic and Functional Neurosurgery

Editor: Sameer A. Sheth, MD,
PhD, FAANS

Message from the President

In This Issue...

2

WSSFN 2017 Wrap-up

2017 AANS Gildenberg
Award in Stereotactic and
Functional Neurosurgery

3

Stereotactic and
Functional News and
Notes

4

2018 Biennial Meeting

5

S&F Contents for CNS
2017 Annual Meeting



Dr. Eskandar

The American Association of Stereotactic and Functional Neurosurgery (ASSFN), serves as an affiliate joint section of the American Association of Neurological Surgeons (AANS) and the Congress of Neurological Surgeons (CNS), and remains deeply involved in a variety

of educational, organizational and advocacy activities on behalf of North American functional neurosurgeons and our patients. It gives me enormous pride and pleasure to be the current president of the ASSFN.

Many members of the society attended the meeting of our sister society, the World Society for Stereotactic and Functional Neurosurgery (WSSFN) in Berlin. This meeting was held on June 26-29, 2017. It was, by all accounts, a tremendous success, with a large and international group of participants and many exciting papers.

We are actively planning for the ASSFN biennial meeting, which will be held June 2-5, 2018, in Denver. This meeting is being organized by past president Aviva Abosch, MD, PhD, FAANS, and will be fantastic. Please mark your calendars now and plan to attend.

Members of the ASSFN/Stereotactic & Functional Section continue to lead the way in promoting scientific and clinical research. Our field is uniquely poised for continued growth with the increased interest in neuromodulation. This offers our members unique access to human brain physiology, the opportunity to explore new indications and the potential to design new devices. We should embrace the new possibilities and constantly strive to advance the field in a rational, ethical and thoughtful fashion.

I look forward to seeing you all at the upcoming meetings.

Sincerely yours,

Emad Eskandar, MD, MBA, FAANS
Massachusetts General Hospital
Harvard Medical School

WSSFN 2017 Wrap-up

The 17th Quadrennial Meeting of the World Society for Stereotactic and Functional Neurosurgery (WSSFN) was held in Berlin from June 26-29, 2017. Joachim Krauss, MD, PhD, IFAANS, presided over the meeting, which was a tremendous success by all standards. He also officially ended his four-year term as president of WSSFN and handed over the leadership reins to Michael Schulder, MD, FAANS.

The Scientific Program was vast and deep, thanks to the efforts of co-chairs Mojgan Hodaie, MD, MSc, and Jean Regis, MD. It covered the full range of topics relevant to stereotactic and functional neurosurgery, including movement disorders, pain, epilepsy, psychiatric neurosurgery, radiosurgery, spasticity and basic neuroscience research. A record 460 abstracts were submitted, and nearly 800 individuals registered to attend the meeting from 60 countries around the world. To encourage worldwide participation and foster excellence in clinical and basic research, six named awards were given out. The Spiegel-Wycis Award was given to Yves Lazorthes, MD, and Francisco Velasco, MD, PhD; the Tasker Award to David Roberts, MD, FAANS(L); the Mundinger Award to Itzakh Fried, MD, PhD, FAANS; and the Riechert Award was shared between Dario Englot, MD, PhD, and Hemmings Wu, MD, PhD. In addition, 24 travel awards were given to individuals from Africa, Europe, Asia and the Americas.



Congratulations to the WSSFN leadership for a fantastic meeting, and we look forward to the 2019 meeting, which is being organized by current WSSFN president Michael Schulder, MD, FAANS.

Sameer Sheth, MD, PhD, FAANS
Columbia University

2017 AANS Gildenberg Award in Stereotactic and Functional Neurosurgery



The Philip L. Gildenberg Resident Award in Stereotactic and Functional Neurosurgery was given at the 2017 AANS Annual Scientific Meeting to Sarah Bick, MD, a resident at the Massachusetts General Hospital in Boston. Her presentation was entitled, “Caudate Stimulation Enhances Human Associative Learning.” This work examined the role of the caudate nucleus in human learning. Epilepsy patients with depth electrodes implanted for clinical seizure localization participated

in an associative learning task. Caudate beta power changes were seen during feedback, when subjects learned whether their response was correct, and changes were different for correct versus

incorrect trials. Caudate stimulation during this same time epoch following correct trials improved learning and was associated with dorsolateral prefrontal cortex and nucleus accumbens power changes. This work suggests that caudate stimulation during reinforcement of correct associations enhances learning and is associated with power changes in both dopaminergic circuitry involved in reward processing and areas involved in associative processes, supporting a role for the caudate in integrating reward information with associations. Dr. Bick is a fifth year resident at the Massachusetts General Hospital. She plans to pursue fellowship training in stereotactic and functional neurosurgery, followed by a career as an academic functional neurosurgeon with an interest in epilepsy, movement and psychiatric disorders.

Movement Disorders

- Preliminary results from an open-label study of Gamma Knife subthalamotomy for Parkinson's disease were reported by Regis et al. at WSSFN. Patients experienced a 66 percent reduction in dyskinesia, but UPDRS motor score benefit and motor fluctuation benefit were modest.
- A small, open-label study of spinal cord stimulation in Parkinson's disease patients with postural instability and gait disturbance showed a marked benefit in timed-walking tests. Larger trials are underway to confirm this finding ([Pinto de Souza et al., Mov Dis 2017](#)).
- DBS for MS tremor has been controversial. A small, randomized trial demonstrated an approximately 30 percent benefit in severity score ([Oliveria et al., Lancet Neurol 2017](#)).
- Boston Scientific received EU permission to market its Vercise Gevia deep brain stimulation system. The Gevia system features directional, constant-current stimulation with independent current control for each segment and is MRI-conditional and rechargeable. It is not yet available in the U.S.

Epilepsy

- The first large, randomized, controlled study of a component of medical marijuana for refractory epilepsy was published. Patients with Dravet syndrome, a hard-to-control seizure disorder, experienced a significant decrease in seizure frequency ([Devinsky et al., NEJM 2017](#)).
- The Neuropace responsive neurostimulation (RNS) device was the subject of several recent studies. Two subgroup analyses of the largest prospective RNS study were published, describing 70 percent seizure reduction in mesial temporal onsets ([Geller et al., Epilepsia 2017](#)) and 58 percent seizure reduction with neocortical onsets ([Jobst et al., Epilepsia 2017](#)).

Chronic pain

- Medtronic has released its Intellis platform for spinal cord stimulation. The Intellis platform features much longer-distance wireless programming than any prior Medtronic device, as well as improved recharging capabilities. The trial electrodes are also programmable in a wireless fashion.

- Nevro has initiated the SENZA-PDN study to evaluate the efficacy of high-dose stimulation to treat painful diabetic neuropathy. The original SENZA randomized controlled trial was selected as the top pain paper of 2016-2017 by *Neurosurgery* ([Kapural et al., Neurosurg 2016](#)).

New Directions

- While results from the BROADEN trial of DBS for depression (halted at interim futility analysis) are not yet available, recent data suggests that individualized targeting strategies may improve outcomes. The Emory group has refined their targeting approach using DTI to prospectively identify key white matter structures and reported an 82 percent one-year response rate ([Riva-Posse et al., Mol Psych 2017](#)).
- A relatively large (19 patients) randomized trial of pallidal stimulation for Tourette's did not show a benefit at three months of blinded stimulation, which was the primary endpoint ([Welter et al., Lancet Neurol 2017](#)).
- Cerebellar deep brain stimulation may help with recovery after stroke. Preliminary human results presented by Baker et al. were described at the WSSFN meeting, and a larger trial is ongoing.
- For the first time, a fully implanted visual prosthetic was implanted in a human being with blindness. Phosphenes were reliably produced using the Neuropace RNS device, as reported by Pouratian et al. at WSSFN.
- The medial forebrain bundle has emerged as a promising therapeutic target in major depression. Promising results from Europe have recently been published ([Bewernick et al., Brain Stim 2017](#)), and similar results were also reported by Fenoy et al. at WSSFN.
- A novel technique for noninvasive deep brain stimulation was demonstrated by a group at MIT and shown to affect neural activity ([Grossman et al., Cell 2017](#)). Multiple interfering electrical fields influenced spiking activity in rodents. Of course, many years of further work will be needed before any such device is trialed in humans.

Chuck Mikell, MD
Stony Brook, NY

American Society for Stereotactic
and Functional Neurosurgery

2018 | BIENNIAL MEETING

D E N V E R

Westin Denver Downtown • June 2-5, 2018



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





PROGRAM HIGHLIGHTS



SANS
ANNUAL MEETING

SANS supplemental exam is available for an additional \$15.

PA SF 8:00 am–5:00 pm Fee: \$300

SYM1 Functional Neurosurgery Update

COURSE DIRECTORS: Ron L. Alterman, Jonathan Miller, Nader Pouratian

SPEAKERS: Ron L. Alterman, Sharona Ben-Haim, Kim J. Burchiel, Stephan Chabardes, Antonio DeSalles, Paresh Doshi, Kelly D. Foote, Robert R. Goodman, Jorge A. Gonzalez-Martinez, Robert E. Gross, Ryder Gwinn, Michael G. Kaplitt, Douglas Kondziolka, Peter Konrad, Andre Machado, Bhaskara R. Malla, Jonathan Miller, Nader Pouratian, Sameer A. Sheth

COURSE DESCRIPTION: Recent clinical data and technological developments have led to a rapid evolution of functional neurosurgery applications with potential treatments for a wide variety of disorders. This symposium will be a forum in which participants can obtain information about recent ideas that impact delivery of current therapies and development of new approaches. The course will cover the latest developments in stereotactic targeting, electrode implantation, surgical treatment of movement disorders and epilepsy, the renaissance of stereotactic lesions, and the frontier of restorative neurosurgery for a variety of disorders that have no other therapeutic options. The course will also cover basics of functional neurosurgery program development and practical considerations of patient selection, as well as operative technique. In a series of breakout sessions, participants will have an opportunity to learn about cutting-edge technical developments.

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Explain the difference in outcome for each target used for deep brain stimulation and identify the appropriate targets for clinical indications that are amenable to this treatment.
- List the advantages, drawbacks, and limitations of the various strategies for intracranial electrode placement, including awake versus "asleep" deep brain stimulator implantation.
- Describe the role of therapeutic lesions, including MR guided focused ultrasound, in the management of movement and other disorders.
- Review recent developments in the surgical treatment of epilepsy, including minimally-invasive approaches.

8:00–9:00 am
Didactic Session 1: Update on Electrode Implantation Techniques

8:00–8:15 am
Frame Versus Frameless Surgery for DBS
Peter Konrad

8:15–8:30 am
Point-Counterpoint: DBS Requires Awake Mapping/Testing
Ron L. Alterman

8:30–8:45 am
Point-Counterpoint: DBS Should Be Done Asleep
Kim J. Burchiel

8:45–9:00 am
Panel Discussion

9:00–9:30 am
Morning Breakout Session with Corporate Sponsor

9:30–10:30 am
Didactic Session 2: Emerging Concepts in Movement Disorders

9:30–9:45 am
STN Versus GPI: The Continuing Debate
Jonathan Miller

9:45–10:00 am
Advanced Imaging for Movement Disorder Surgery
Nader Pouratian

SYMPOSIUM 1



10:00–10:15 am
Directional Leads, Current Steering, and Graphical Programming
Stephan Chabardes

10:15–10:30 am
Panel Discussion

10:30–11:00 am
Morning Breakout with Corporate Sponsor

11:00 am–12:00 pm
Didactic Session 3: Brain Stimulation for Non-motor Disorders

11:00–11:15 am
Brain Stimulation for Pain: Time to Revisit DBS?
Andre Machado

11:15–11:30 am
Tourette's Syndrome
Kelly D. Foote

11:30–11:45 am
Obsessive-compulsive Disease
Sameer A. Sheth

11:45 am–12:00 pm
Panel Discussion

12:00–1:00 pm
Lunch

1:00–2:00 pm
Didactic Session 4: Emerging Concepts in Stereotactic Lesioning

1:00–1:15 pm
High-intensity Focused Ultrasound: First Line or Alternative Approach?
Ryder Gwinn

1:15–1:30 pm
Gamma Knife in Functional Neurosurgery
Douglas Kondziolka

1:30–1:45 pm
Radiofrequency Ablation in Functional Neurosurgery
Paresh Doshi

1:45–2:00 pm
Wisdom of Lesioning Versus DBS
Ron L. Alterman

2:00–2:30 pm
Afternoon Breakout Session with Corporate Sponsor

2:30–3:30 pm
Didactic Session 5: Emerging Concepts in Epilepsy Surgery

2:30–2:45 pm
Neuromodulation for Epilepsy
Robert R. Goodman

2:45–3:00 pm
Minimally Invasive Lesioning: Laser and HIFU
Robert E. Gross

3:00–3:15 pm
Stereo-EEG Techniques: Frame Versus Robot
Jorge A. Gonzalez-Martinez

3:15–3:30 pm
Operative Approaches to Optimize the Outcomes of Drug-resistant Epilepsy
Bhaskara R. Malla

3:30–4:00 pm
Afternoon Breakout Session with Corporate Sponsor

4:00–5:00 pm
Didactic Session 6: Emerging Therapies for Restorative Neurosurgery

4:00–4:15 pm
Gene and Cellular Therapies
Michael G. Kaplitt

4:15–4:30 pm
Investigational DBS: Psychiatry, Obesity, and Cognition
Antonio DeSalles

4:30–4:45 pm
Building an Integrated Functional Neurosurgery Program
Sharona Ben-Haim

4:45–5:00 pm
Panel Discussion

SU
OCT 8



PROGRAM HIGHLIGHTS

SF 12:30-4:00 pm

Fee: \$450

PC28 Integrating New Technology Into Your Work Flow: LITT, RNS, Stereo EEG, and Surgical Robots

COURSE DIRECTOR: Daniel Curry

FACULTY: Shabbar F. Danish, David D. Gonda, Jorge A. Gonzalez-Martinez

COURSE DESCRIPTION: Implementing and integrating new technologies into established clinical practice can be challenging, but may lead to improved patient outcomes and further advancement of the field. Recent new technologies and their unique challenges and benefits will be discussed.

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Discuss the potential advantages of bringing new technology into the clinical workflow of an established practice.
- Review the challenges faced with integration of specific technologies and how they may be managed to optimize efficient implementation.
- Identify the benefits and potential impact on patient outcome, along with available evidence, for recently developed technologies.

AP PA 12:30-4:00 pm

Fee: \$450

PC29 Neurosurgical Treatment of Chronic Headache

COURSE DIRECTORS: Jason M. Schwalb, Egilius Spierings

FACULTY: L. Dade Lunsford, Cormac O. Maher, Wouter I. Schievink, Ashwini D. Sharan, Jennifer A. Sweet

COURSE DESCRIPTION: This course will focus on the decision-making of neurosurgeons confronting patients with chronic headaches. Using case-based discussions, the faculty will discuss identification of patients who are likely to do well with neurosurgical intervention and those who are not. Evidence-based medical and surgical options will be discussed for each condition.

LEARNING OBJECTIVES: Upon completion of this course, attendees will be able to:

- Discuss appropriate workup and non-neurosurgical management of different causes of chronic headache.
- Develop patient selection tools to improve neurosurgical outcomes and apply these tools to their practices.
- Review current evidence-based treatment of chronic headache.

SF 12:30-4:00 pm

Fee: \$450

PC33 Laser Ablation Surgery: Opportunities, Indications, Technique, and Outcome

COURSE DIRECTOR: Shabbar F. Danish

FACULTY: Daniel Curry, Robert E. Gross, Ganesh Rao

COURSE DESCRIPTION: MR-guided laser ablation is rapidly emerging as a minimally invasive alternative for the treatment of epilepsy, metastatic tumors, radiation necrosis, cavernous malformations, and other intracranial pathology. In this course, we will review techniques, applications, and outcomes to illustrate the gaps this emerging technology can fill for neurosurgeons and prospective patients.

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Explain the underlying principles of image-guided laser ablation.
- List the indications for MR-guided laser ablation.
- Describe the outcomes and risks of MR-guided laser ablation surgery.
- Apply these principles of patient selection for performance and/or referral of MR-guided laser ablation.

PROGRAM HIGHLIGHTS



MO
OCT 9

SF 12:15-1:45 pm

M08 Minimally Invasive Epilepsy Surgery

MODERATOR: Sarat P. Chandra

FACULTY: Prakash Chandra, David D. Gonda, Charles Y. Liu

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Identify recent technical advances that allow minimally invasive surgical treatment of epilepsy, including evidence for clinical efficacy.
- Outline limitations and possible complications of minimally invasive ablation, neuromodulation, and endoscopic epilepsy procedures.
- Describe specific clinical situations in which minimally invasive epilepsy surgery techniques would be appropriate and how they would be most effectively applied.

AP RE SF 12:15-1:45 pm

M09 Clinical Trials Review of Key Stereotactic and Functional Studies: Update on the Clinical Translation

MODERATORS: Aviva Abosch, Emad N. Eskandar

FACULTY: W. Jeffrey Elias, Clement Hamani, Sameer A. Sheth, Philip A. Starr

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Identify key results that guide surgical decision-making in the management of patients with Parkinson's disease.
- Describe recent advances in the neuromodulatory management of epilepsy.
- Utilize the latest evidence in psychiatric neurosurgery to optimize patients with medically refractory psychiatric disease.

PROGRAM HIGHLIGHTS



SF 2:45–4:15 pm

Section on Stereotactic and Functional Neurosurgery

MODERATORS: Emad N. Eskandar, Jonathan Miller

SPEAKERS: Steven M. Falowski, Sean J. Nagel, Ashwini D. Sharan

LEARNING OBJECTIVES: Upon completion of this course, attendees will be able to:

- Discuss different methods for spinal cord stimulator implant, including different anesthetic regimens, and its impact on clinical outcomes.
- Review spinal cord stimulation outcomes using novel stimulation paradigms, including burst and high frequency stimulation.
- Define the indications for dorsal root ganglion stimulation and how this approach differs from traditional spinal cord stimulation.
- Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.

2:45–3:30 pm

Emerging Concepts in Spinal Cord Stimulation

2:45–3:00 pm

Asleep Spinal Cord Stimulator Implantation

Steven M. Falowski

3:00–3:15 pm

Burst and High Frequency Spinal Cord Stimulation

Ashwini D. Sharan

3:15–3:30 pm

Dorsal Root Ganglion Stimulation

Sean J. Nagel

SF 4:15–6:15 pm

Case-based Discussion Session—Epilepsy

MODERATOR: Joseph S. Neimat

FACULTY: Aviva Abosch, Itzhak Fried, Steven N. Roper

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Discuss various treatment options for the epilepsy.
- Describe common complications in epilepsy surgery.
- Strategize how to identify and avoid complications in epilepsy surgery.
- Incorporate emerging treatment strategies for epilepsy into your practice.

PA 2:45–4:15 pm

Section on Pain

MODERATOR: Darlene A. Lobel, Jason M. Schwalb

SPEAKERS: John D. Markman, Christopher J. Winfree

LEARNING OBJECTIVES: Upon completion of this session, participants will be able to:

- Interpret evidence related to opioid efficacy in the treatment of pain and safe prescribing practices.
- Discuss the indications for use of medical marijuana, evidence, state and federal regulations, and relevance to neurosurgical practice.
- Describe ongoing research in the neurosurgical treatment of pain.

2:45–3:33 pm

The Opioid Epidemic and Medical Marijuana

2:45–3:05 pm

Opioid Prescribing in Neurosurgical Practice: Balancing Relief and Risks

John D. Markman

3:05–3:25 pm

Medical Marijuana: What Neurosurgeons Need to Know to Optimize the Treatment of Their Chronic Pain Patients

Christopher J. Winfree

3:25–3:33 pm

Questions and Discussion

PA 4:15–6:15 pm

Case-based Discussion Session—Management of Trigeminal Neuralgia

MODERATORS: Jason M. Schwalb, Jennifer A. Sweet

FACULTY: Jeffrey A. Brown, Kim J. Burchiel, Milind S. Deogaonkar, William A. Friedman

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Discuss various treatment options for the management of trigeminal neuralgia.
- Describe common complications in trigeminal neuralgia surgery.
- Strategize how to identify and avoid complications in trigeminal neuralgia surgery.

TU
OCT 10



PROGRAM HIGHLIGHTS

T17 Retreating Trigeminal Neuralgia 12:15–1:45 pm

MODERATOR: Ellen L. Air

FACULTY: Sharona Ben-Haim, Steven L. Giannotta, Konstantin V. Slavin, Jennifer A. Sweet

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Discuss the success profile of various TGN treatment modalities and recurrence rates.
- Assess impact of treatment history on available options for treating recurrent TGN.
- Review surgical indications for recurrent TGN and complication profile.

T22 Building a Functional Neurosurgery Practice 12:15–1:45 pm

MODERATOR: Michael Schulder

FACULTY: Gordon H. Baltuch, Kelly D. Foote, Joshua M. Rosenow, Ashwin Viswanathan

LEARNING OBJECTIVES: Upon completion of this course, participants will be able to:

- Establishing protocols to optimize patient outcomes in functional neurosurgery.
- Interpret nuances of documentation and coding.
- Employ a multidisciplinary approach to building a successful functional neurosurgery practice.

TU
OCT 10



PROGRAM HIGHLIGHTS

PA 2:45–4:15 pm

Section on Pain

MODERATORS: Jeffrey E. Arle, Ashwin Viswanathan

SPEAKER: Brian J. Wainger

LEARNING OBJECTIVES: *Upon completion of this session, participants will be able to:*

- Discuss the mechanisms of physiological pain and the structural changes that underlie the development of pathological pain.
- Describe ongoing research in the neurosurgical treatment of pain.

2:45–3:27 pm

Mechanisms of Pain

2:45–3:05 pm

Mechanisms of Physiological and Pathological Pain

Brian J. Wainger

3:05–3:27 pm

Questions and Discussion

3:27–4:15 pm

Oral Presentations

See page 67 for Oral Papers 201–206.

SF 4:15–6:15 pm

Case-based Discussion Session—Stereotactic and Functional

MODERATOR: Peter Konrad

FACULTY: Rees Cosgrove, Jean-Philippe Langevin, Andre Machado, Joseph S. Neimat, Francisco A. Ponce

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss various treatment options for stereotactic and functional surgery.
- Describe common complications in stereotactic and functional surgery.
- Strategize how to identify and avoid complications in stereotactic and functional surgery.

SF 2:45–4:15 pm

Section on Stereotactic and Functional Neurosurgery

MODERATORS: Aviva Abosch, Julie G. Pilitsis

SPEAKERS: Ron L. Alterman, Paresh Doshi, W. Jeffrey Elias

LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*

- Discuss options, limitations, and opportunities of open- versus closed-loop deep brain stimulation.
- Define the role of both open and incisionless ablative surgery for functional applications.
- Analyze the findings of novel neurosurgical studies and critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.

2:45–3:30 pm

Surgical Approaches for Movement Disorders

2:45–3:00 pm

Open-loop Deep Brain Stimulation

Ron L. Alterman

3:00–3:15 pm

High-intensity MR-guided Focused Ultrasound

W. Jeffrey Elias

3:15–3:30 pm

Radiofrequency Lesioning

Paresh Doshi

3:30–4:15 pm

Oral Abstract Presentations

See pages 67–68 for Oral Papers 214–221.

WE
OCT 11



PROGRAM HIGHLIGHTS

PA 12:15–1:45 pm

W32 SCS-evidence and Expertise

MODERATOR: Erika A. Petersen

FACULTY: Ellen L. Air, Richard B. North, Francisco A. Ponce, Alexander S. Taghva

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss patient selection factors for SCS trial.
- Review changes in SCS technology.
- Explain surgical management and decision making in SCS placement.
- Outline strategies for management of complications associated with SCS.



SUBSPECIALTY SESSION HIGHLIGHTS

PA = PAIN



SA
OCT 7

8:00 am-5:00 pm

SYM1 Functional Neurosurgery Update



SU
OCT 8

12:30-4:00 pm

PC29 Neurosurgical Treatment of Chronic Headache



MO
OCT 9

2:45-4:15 pm

Section on Pain

4:15-6:15 pm

Case-based Discussion Session—Management of Trigeminal Neuralgia



TU
OCT 10

12:15-1:45 pm

Luncheon Seminar

T17 Retreating Trigeminal Neuralgia

2:45-4:15 pm

Section on Pain

4:15-6:15 pm

Case-based Discussion Session—Revision Spinal Surgery or Neuromodulation



WE
OCT 11

12:15-1:45 pm

Luncheon Seminar

W32 SCS-evidence and Expertise



SUBSPECIALTY SESSION HIGHLIGHTS

SF = STEREOTACTIC AND FUNCTIONAL



SA
OCT 7

8:00 am–5:00 pm

SYM1 Functional Neurosurgery Update



MO
OCT 9

12:15–1:45 pm

Luncheon Seminars

M08 Minimally Invasive Epilepsy Surgery

M09 Clinical Trials Review of Key Stereotactic and Functional Studies: Update on the Clinical Translation

2:45–4:15 pm

Section on Stereotactic and Functional Neurosurgery

4:15–6:15 pm

Case-based Discussion Session—Epilepsy



SU
OCT 8

12:30–4:00 pm

PC28 Integrating New Technology Into Your Work Flow: LITT, RNS, Stereo EEG, and Surgical Robots

PC33 Laser Ablation Surgery: Opportunities, Indications, Technique, and Outcome



TU
OCT 10

12:15–1:45 pm

Luncheon Seminar

T22 Building a Functional Neurosurgery Practice

2:45–4:15 pm

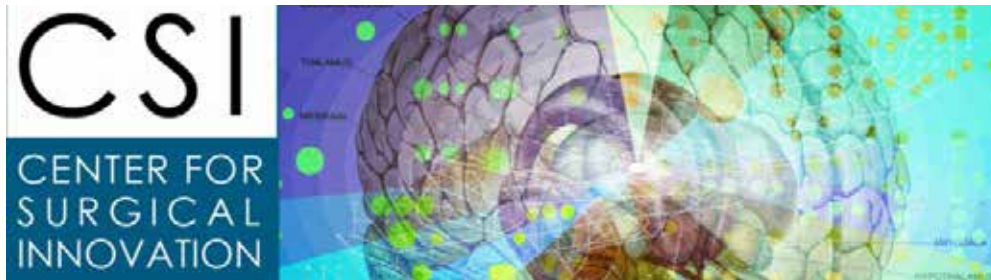
Section on Stereotactic and Functional Neurosurgery

4:15–6:15 pm

Case-based Discussion Session—Stereotactic and Functional

The ASSFN

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



Stereotactic and Functional Neurosurgery Hands-on Workshop

November 10-12, 2017

**Center for Surgical Innovation
Aurora, Colorado**