Advance Registration Deadline: September 18, 2014
The moment you visualize blood flow dynamics to make decisions in real time.

FLOW 800 from ZEISS

// BEYOND VISUALIZATION
MADE BY ZEISS

Sequence: Delay Map
Instant visual capture of blood flow dynamics.

Direction: Pinpoint Analysis
Blood flow evaluation of specific anatomical regions.

Speed: Blood Flow Over Time
Visualize the variation in blood flow over time.

Sequence, Direction and Speed. FLOW® 800 from ZEISS – Vascular Blood Flow Dynamics, Realized.

ZEISS FLOW 800 is a unique quantitative analysis tool generating blood flow dynamics data by identifying detailed vessel blood flow intraoperatively. Transformation of ZEISS INFRARED 800 video data into summary maps and diagrams support fast identification of AVM feeding arteries, nidal vessels and draining veins — providing objective access to speed and sequence of blood flow.

To learn more, call your ZEISS representative or visit us at www.meditec.zeiss.com/contacts.

Images courtesy of Dr. Yasushi Takagi, M.D. Ph.D. Department of Neurosurgery, Kyoto University, Kyoto, Japan
www.meditec.zeiss.com/flow
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On behalf of the Congress of Neurological Surgeons Executive Committee, the Scientific Program Committee, and the 2014 CNS Honored Guest, Dr. Edward C. Benzel, I invite you to attend this year’s CNS Annual Meeting in Boston, Massachusetts, October 18-22, 2014.

Our theme for this year’s Annual Meeting is *A Question of Balance*, focusing on the competing challenges faced by neurosurgeons in their everyday practice.

In response to the enthusiastic reception of live surgery broadcast through Telemedicine Technology, we will be featuring three live surgeries via Telemedicine Technology in the Exhibit Hall this year. Other highlights include sessions centered around “hot topics” such as pediatric sports related injuries and innovations in neurosurgery, controversies sessions dedicated to opposing paradigms for the same pathology, a retooled 3-D anatomy course and talks by authors of some of the top papers published in *Neurosurgery* in the past year, including a new late-breaking research category. We will also be recognizing an outstanding lineup of featured speakers.

The CNS Annual Meeting is an amazing opportunity for scientific exchange and networking with thousands of your colleagues and friends from around the world, and to explore opportunities to enhance your skill sets, help your practice and improve patient care. We anticipate this year’s Annual Meeting will be one of the largest CNS gatherings in history, as we host our colleagues from the Israel Neurosurgical Society, our 2014 international partner organization.

The 2014 CNS Annual Meeting promises to be a unique experience, focusing on clinical equipoise, novel therapeutics and innovative science. Don’t miss your chance to be a part of this meeting. I invite you to join me in Boston and help you answer the *Question of Balance*.
## 2014 AT-A-GLANCE

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td><strong>SATURDAY</strong></td>
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<tr>
<td>8:00 AM – 4:00 PM</td>
<td><strong>Symposia 01: Neurovascular Update 2014</strong></td>
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<tr>
<td>8:00 AM – 4:00 PM</td>
<td>Full Day Practical Courses (PC01 – PC06)</td>
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<td>8:00 AM – 11:30 AM</td>
<td>Morning Practical Courses (PC07 – PC11)</td>
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<td>12:30 – 4:00 PM</td>
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<td>5:00 – 6:30 PM</td>
<td>International Reception</td>
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<td>6:00 – 8:30 PM</td>
<td><strong>Dinner Seminar (DIN01):</strong> Treating the One-level Cervical Disc Herniation with Radiculopathy: ACDF vs. Arthroplasty vs. Posterior Approach</td>
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<td></td>
<td><strong>Dinner Seminar (DIN02):</strong> Emerging Technologies and Their Role in the Clip Versus Coil Debate</td>
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<tr>
<td><strong>SUNDAY</strong></td>
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<tr>
<td>8:00 AM – 4:00 PM</td>
<td><strong>Symposia 02: Neuro-vation</strong> (CME not offered for this course)</td>
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<tr>
<td>8:00 AM – 4:00 PM</td>
<td>Full Day Practical Courses (PC18 – PC20)</td>
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<td>8:00 AM – 11:30 AM</td>
<td>Morning Practical Courses (PC21 – PC25)</td>
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<tr>
<td>1:00 – 3:00 PM</td>
<td>CNS Resident SANS Challenge Preliminary Rounds</td>
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<tr>
<td>1:30 – 4:00 PM</td>
<td><strong>Choice Abstracts: Spanning the Spectrum of Neurosurgery</strong></td>
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<tr>
<td>4:15 – 6:40 PM</td>
<td><strong>General Scientific Session I</strong></td>
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<tr>
<td>6:45 – 8:30 PM</td>
<td><strong>CNS Opening Reception</strong> Bostra Convention and Exhibition Center</td>
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<tr>
<td>7:00 – 8:30 AM</td>
<td><strong>CNS Original Science Program – Section Session Meetings</strong></td>
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<tr>
<td>8:30 AM – 4:15 PM</td>
<td>Exhibit Hall Open</td>
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<tr>
<td>8:30 – 9:00 AM</td>
<td>Exhibit Hall Coffee Break</td>
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<tr>
<td>9:00 – 11:30 AM</td>
<td><strong>General Scientific Session II</strong></td>
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<tr>
<td>11:30 AM – 12:30 PM</td>
<td>Exhibit Hall Break</td>
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<tr>
<td>11:45 AM – 12:30 PM</td>
<td><strong>Live Surgery in the Exhibit Hall:</strong> Expanded Endonasal Endoscopy</td>
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<tr>
<td>12:30 – 2:00 PM</td>
<td>Luncheon Seminars (M01 – M09)</td>
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<td>12:30 – 2:00 PM</td>
<td>Industry Sponsored Lunch Symposia</td>
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<tr>
<td>2:00 – 3:30 PM</td>
<td><strong>Hot Topics 1:</strong> The Management of Concussion in Children and Young Adults</td>
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<tr>
<td>2:00 – 3:30 PM</td>
<td><strong>Hot Topics 2:</strong> The Balance Due: Payment for Neurosurgeons  Practical Guide to the Current Health Delivery System</td>
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<tr>
<td>2:00 – 3:30 PM</td>
<td><strong>Controversy Session:</strong> Extent of Resection of Benign Skull Base Tumors and Neo-adjuvant Radiosurgery Followed by Resection of Brain Metastases: Yes Versus No</td>
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<tr>
<td>3:30 – 4:15 PM</td>
<td>Exhibit Hall Beverage Break</td>
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<tr>
<td>4:15 – 5:30 PM</td>
<td><strong>Consensus Session I:</strong> Management of Gliomas</td>
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<tr>
<td>4:15 – 5:30 PM</td>
<td><strong>CNS Original Science Program – International Neurosurgical Forum</strong></td>
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<tr>
<td>4:15 – 5:30 PM</td>
<td><strong>3-D Neurosurgery:</strong> Techniques to Advance Safety and Efficacy in Micro-neurosurgery</td>
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<tr>
<td>6:00 – 8:30 PM</td>
<td><strong>Dinner Seminar (DIN03):</strong> Evolving Strategies in Glioblastoma: Case-Based Presentations</td>
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<td><strong>Dinner Seminar (DIN04):</strong> Neurosurgery in the Changing Health Care System</td>
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### Tuesday, October 21

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<th>Event</th>
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<tr>
<td>7:00 – 8:30 AM</td>
<td><strong>CNS Original Science Program – Section Oral Presentations</strong></td>
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<tr>
<td>8:30 AM – 4:15 PM</td>
<td>Exhibit Hall Open</td>
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<tr>
<td>8:30 – 9:00 AM</td>
<td>Exhibit Hall Coffee Break</td>
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<tr>
<td>9:00 – 11:30 AM</td>
<td><strong>General Scientific Session III</strong></td>
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<tr>
<td>11:30 AM – 12:30 PM</td>
<td>Exhibit Hall Break</td>
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<tr>
<td>11:45 AM – 12:15 PM</td>
<td><strong>Live Surgery in the Exhibit Hall</strong>: Sylvian Fissure Dissection</td>
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<tr>
<td>12:30 – 2:00 PM</td>
<td>Luncheon Seminars (T10 – T18)</td>
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<tr>
<td>12:30 – 2:00 PM</td>
<td>SANS Challenge Championship Round</td>
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<tr>
<td>12:30 – 2:00 PM</td>
<td>Industry Sponsored Lunch Symposia</td>
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<tr>
<td>2:00 – 3:30 PM</td>
<td><strong>Hot Topics 3</strong>: Balancing Quality and Cost in the Era of the Affordable Care Act</td>
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<tr>
<td>2:00 – 3:30 PM</td>
<td><strong>Hot Topics 4</strong>: The Management of Chiari Type 1 Malformation</td>
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<tr>
<td>2:00 – 3:30 PM</td>
<td><strong>Controversy Session</strong>: Degenerative Scoliosis and TL Burst</td>
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<tr>
<td>3:30 – 4:15 PM</td>
<td>Exhibit Hall Beverage Break</td>
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<tr>
<td>4:15 – 5:30 PM</td>
<td><strong>Consensus Session II</strong>: Management of Metastatic Tumors of the Spine</td>
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<tr>
<td>4:15 – 5:30 PM</td>
<td><strong>CNS Original Science Program – Neurosurgical Forum</strong></td>
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<tr>
<td>4:15 – 5:30 PM</td>
<td><strong>2-D Neurosurgery</strong>: Intraoperative Complications Avoidance and Management</td>
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<tr>
<td>5:30 – 6:30 PM</td>
<td>Resident Recruitment Social</td>
</tr>
<tr>
<td>6:00 – 8:30 PM</td>
<td><strong>Dinner Seminar (DIN05)</strong>: Social Media: Balancing Your Practice’s Needs with Your Privacy</td>
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<td><strong>Dinner Seminar (DIN06)</strong>: The New Standards: Outcome Measures in Neurosurgery</td>
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### Wednesday, October 22

<table>
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<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:00 – 8:00 AM</td>
<td><strong>Late Breaking Science</strong></td>
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<tr>
<td>8:00 – 10:30 AM</td>
<td><strong>General Scientific Session IV</strong></td>
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<tr>
<td>10:00 AM – 1:00 PM</td>
<td>Exhibit Hall Open</td>
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<tr>
<td>10:30 – 11:30 AM</td>
<td>Exhibit Hall Coffee Break</td>
</tr>
<tr>
<td>10:45 – 11:15 AM</td>
<td><strong>Live Surgery in the Exhibit Hall</strong>: Fluoroscopic Lateral Approach to the Spine</td>
</tr>
<tr>
<td>11:30 AM – 1:00 PM</td>
<td>Luncheon Seminars (W19 – W24)</td>
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<tr>
<td>11:30 AM – 1:00 PM</td>
<td>Industry Sponsored Lunch Symposia</td>
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<tr>
<td>1:00 – 2:15 PM</td>
<td><strong>Hot Topics 5</strong>: Balancing Clinical Research and Individualized Care: The Era of “Personalized Medicine”</td>
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<tr>
<td>1:00 – 2:15 PM</td>
<td><strong>Hot Topics 6</strong>: Balancing the Future: Neurosurgery in 2025</td>
</tr>
<tr>
<td>1:00 – 2:15 PM</td>
<td><strong>Controversy Session</strong>: Management of Unruptured Intracranial Aneurysms</td>
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**ARE YOU CONNECTED TO THE CNS?** Follow us on Facebook, Twitter and LinkedIn for the most up-to-date information and meeting updates!

Stay connected at http://m.cns.org
Daily Controversy Sessions

Using a Point/Counterpoint format, gain insight and understanding by listening to neurosurgical experts debate critical issues facing our profession.

MON 20 OCT
2:00 – 3:30 PM
Extent of Resection of Benign Skull Base Tumors Neo-adjuvant Radiosurgery Followed by Resection of Brain Metastases: Yes Versus No

TUE 21 OCT
2:00 – 3:30 PM
Degenerative Scoliosis TL Burst

WED 22 OCT
1:00 – 2:15 PM
Management of Unruptured Intracranial Aneurysms

Hot Topics

Learn about and discuss the hot topics in the field of neurosurgery today.

MID 20 OCT
2:00 – 3:30 PM
Hot Topic 1
The Management of Concussion in Children and Young Adults

Hot Topic 2
The Balance Due: Payment for Neurosurgeons Practical Guide to the Current Health Delivery System

TUE 21 OCT
2:00 – 3:30 PM
Hot Topic 3
Balancing Quality and Cost in the Era of the Affordable Care Act

Hot Topic 4
The Management of Chiari Type 1 Malformation

WED 22 OCT
1:00 – 2:15 PM
Hot Topic 5
Balancing Clinical Research and Individualized Care: The Era of “Personalized Medicine”

Hot Topic 6
Balancing the Future: Neurosurgery in 2025

Israel: The CNS Annual Meeting Partner

The CNS welcomes the Israel Neurosurgical Society as our official Annual Meeting partner society. Please take the opportunity to network with members of our partner society as well as other CNS international members and guests. Take time to share your challenges and solutions with others throughout the world.
**NEW in the Exhibit Hall**

**Daily Live Surgical Presentations via Telemedicine Technology**

**MON 20 OCT**

11:45 AM – 12:15 PM

EXPANDED ENDONASAL ENDOSCOPY
Operating: **Paul A. Gardner**

**TUE 21 OCT**

11:45 AM – 12:15 PM

SYLVIAN FISSURE DISSECTION
Operating: **Robert F. Spetzler**

**WED 22 OCT**

10:45 – 11:15 AM

FLUOROSCOPIC LATERAL APPROACH TO THE SPINE
Operating: **Robert G. Whitmore**

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**Industry Sponsored Lunch Symposia**

Join your colleagues Monday through Wednesday in the Exhibit Hall for industry-hosted lunch symposia on clinical topics. Check the Annual Meeting Guide mobile app in late summer for more details on available sessions.

**Innovations Showcase**

Stop by this new destination in the Exhibit Hall Monday through Wednesday to learn about the latest technological innovations being displayed in Boston. The showcase lets you browse all these innovations in one convenient location and to talk one on one with representatives from each company about their new technology.

**CNS Foundation Silent Auction**

Help the CNS Foundation meet its mission while scoring the perfect gift for that special someone who has everything. The CNS Foundation, Inc. Silent Auction will offer up a host of exclusive autographed memorabilia daily in the Exhibit Hall — from jerseys, helmets and hockey pucks to autographed guitars, photos and album covers. Proceeds from the auction will support the CNS Foundation, Inc. in fulfilling its mission. New auctions take place daily in the exhibit hall.

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Stay connected at http://m.cns.org
The Congress of Neurological Surgeons exists to enhance health and improve lives worldwide through the advancement of education and scientific exchange in the field of neurosurgery. The CNS Continuing Medical Education (CME) program provides participants with various learning formats to keep current in the field and to improve skills and enhance professional performance to provide the best possible care for their patients.

The CNS CME program is designed, planned and implemented to evaluate a comprehensive collection of activities within the subspecialty of neurosurgery. The CNS plans to yield results that not only contribute to lifelong learning, but also demonstrate change and improvement in competence.

At the conclusion of the 2014 CNS Annual Meeting participants will be able to:

1. Alter their current practice patterns in accordance with the latest data.
2. Compare techniques based on findings discussed during case presentations.
3. Apply and/or perform new techniques based on best practices and current procedures.
4. Practice evidence-based, informed neurosurgical medicine.
5. Interpret newly found outcomes as a result of the scientific abstract presentations.
6. Demonstrate change in competence.

EDUCATIONAL FORMAT DESCRIPTIONS

The CNS offers sessions in a variety of formats to enhance your educational experience. Each session is open to all who have paid the general medical registration fee with the exception of optional Practical Courses, Luncheon Seminars and Dinner Seminars, which are available for an additional fee.

Practical Courses
Didactic and hands-on courses with expert neurosurgical educators demonstrating clinical techniques and applications via technology, models and simulation. Hands-on Practical Courses will provide participants an opportunity to improve surgical skills by applying and demonstrating learned techniques. Practical Courses also provide an opportunity to review case-based complex issues and discuss potential solutions.

- Practical Courses are offered Saturday, October 18 and Sunday, October 19.

General Scientific Sessions, Section Sessions, Luncheon Seminars and Dinner Seminars
Expert lecturers present research, best scientific evidence and associated outcomes demonstrating clinical techniques and applications. The basics of translational development, clinical trials, guideline review and updated changes and evaluation of clinical experience followed by examples of successful application are presented in various sessions. They will present basic skills and information you can apply in your daily practice and professional life.

- General Scientific Sessions and Section Sessions are offered Sunday, October 19 through Wednesday, October 22.
- Luncheon Seminars are offered Monday, October 20 through Wednesday, October 22.
- Dinner Seminars are offered on Saturday, October 18, Monday, October 20 and Tuesday, October 21.

Interactive Discussion with Audience Response Polling during the CNS Consensus Sessions
Consensus Sessions provide an opportunity for expert presentations, discussion and peer debate on various topics, treatments, guidelines and solutions. A review of the best evidence-based literature is conducted and then an opportunity is provided to share your perspective on the optimal management of these disorders as a consensus is reached for the best application of surgical strategies in a variety of clinical scenarios.

- Consensus Sessions are offered on Monday, October 20 and Tuesday, October 21.

Case-Based Education
Challenging neurosurgical cases will be reviewed and discussed in a variety of innovative formats including 3-D Video Presentation, Live Surgery via Telemedicine and Panel Discussions.

- Operative Neurosurgery will take place Monday, October 21 and Tuesday, October 22.
- Live Surgery via Telemedicine in the Exhibit Hall will take place Monday, October 20 through Wednesday, October 22. CME is not offered for these sessions.

Original Science Program
Scientific abstract presentations offer original science, ground-breaking research and the best clinical and basic neurosurgical science in the CNS Original Science Program allowing for audience questions and moderated discussions.

- Choice Abstract Sessions are offered Sunday, October 19.
- Oral Presentations by subspecialty and the CNS Neurosurgical Forum will take place Tuesday, October 21.
- Late Breaking Abstracts will be presented on Wednesday, October 22.
Accreditation
The Congress of Neurological Surgeons is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

CME Credit
The CNS designs this live activity for a maximum of 48.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

* A maximum of 22.75 AMA PRA Category 1 Credits™ may be earned for general sessions only.

This activity has been submitted to the American Association of Neuroscience Nurses for award. The American Association of Neuroscience Nurses is accredited as an approver of continuing nursing education by the American Nurses Credentialing Center’s Commission on Accreditation.

For all other health professionals, please directly contact your state medical association, specialty society or state board for medical licensure.

Additional CME Credits can be earned by attending the following:

Practical Courses
Attendees will receive a maximum of three-and-a-half (3.5) AMA PRA Category 1 Credits™ for each Saturday half-day Practical Course, a maximum of seven (7) AMA PRA Category 1 Credits™ for each eligible Saturday full-day Practical Course, a maximum of three-and-a-half (3.5) AMA PRA Category 1 Credits™ for each eligible Sunday half-day Practical Course, and a maximum of seven (7) AMA PRA Category 1 Credits™ for each eligible Sunday full-day Practical Course. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Luncheon Seminars
Attendees will receive a maximum of one-and-a-half (1.5) AMA PRA Category 1 Credits™ for all eligible Luncheon Seminars. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Dinner Seminars
Attendees will receive a maximum of two (2) AMA PRA Category 1 Credits™ for all eligible Dinner Seminars. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Posters
Physicians may claim a maximum of five (5) AMA PRA Category 1 Credits™ for viewing scientific posters. Physicians should self-claim credit on their AMA PRA certificate application or apply directly to the AMA for an AMA PRA Category 1 Credits™ certificate.

Claiming CME Credit
CME credits can be claimed through the online CME system at www.cns.org. The CME tracking system allows you to create and print a CME certificate immediately following the CNS Annual Meeting while you are still in Boston, or from the convenience of your home or office. Upon completion of this process, your CME certificate will be sent to you via email at the email address you provided at registration.

Disclosures
The Accreditation Council for Continuing Medical Education Standards for Commercial Support requires that anyone in a position to control the content of the educational activity has disclosed all financial relationships with any commercial interest. Failure or refusal to disclose or the inability to satisfactorily resolve the identified conflict may result in the withdrawal of the invitation to participate in any of the CNS educational activities. The ACCME defines a “commercial interest” as any entity producing, marketing, re-selling or distributing healthcare goods or services consumed by, or used on, patients. It is also each speaker’s responsibility to include the FDA clearance status of any device or drug requiring FDA approval discussed or described in their presentation or to describe the lack of FDA clearance for any “off label” uses discussed. Speakers from the audience are also required, therefore, to indicate any relevant personal/professional relationships as they discuss a given topic.

FDA Statement
Some drugs or medical devices demonstrated at the Annual Meeting have not been cleared by the FDA or have been cleared by the FDA for specific purposes only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice. The CNS policy provides that “off label” uses of a drug or medical device may be described at the Annual Meeting so long as the “off label” use of the drug or medical device is also specifically disclosed. Any drug or medical device is “off label” if the described use is not set forth on the products approval label. It is also each speaker’s responsibility to include the FDA clearance status of any device or drug requiring FDA approval discussed or described in their presentation or to describe the lack of FDA clearance for any “off label” uses discussed. Speakers from the audience are also required, therefore, to indicate any relevant personal/professional relationships as they discuss a given topic.
Edward C. Benzel, MD
Chairman of the Department of Neurosurgery at Cleveland Clinic and Professor of Surgery at the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University

Dr. Benzel’s major clinical interests embrace many aspects of neurosurgery, but are focused on spinal disorders including cervical spondylosis, syringomyelia, complex spine instrumentation and spine tumors. His clinical research has encompassed such issues as hydrocephalus, neonatal hemorrhage, cerebrovascular disorders, cranial trauma, critical care, brain death, microelectromechanical systems (MEMS) and of course, spinal disorders. From a research perspective, he currently is focusing on Spine biomechanics and clinical research, as well as sports related concussion research. The latter has centered about strategies to reduce risk and increase protection for athletes involved in contact sports.

He has been actively involved in the Congress of Neurological Surgeons, American Association of Neurological Surgery, North American Spine Society (NASS), World Spinal Column Society and Cervical Spine Research Society. Dr. Benzel is one of the founding members of the Lumbar Spine Research Society, formed in 2007. He serves on numerous committees, and in multiple different positions of the various societies.

His continual rigorous review of clinical and research content for several professional neurosurgical and spine publications contributes significantly to the body of literature. He was Co-Chairman of the Editorial Review Board of the Journal of Neurosurgery (2003-2004), and is currently Chairman of the Review Board for the Journal of Neurosurgery: Spine. He has served as a reviewer for Neurosurgery, Spine and The Spine Journal, and is an ad hoc reviewer for several other journals.

He has authored 10 textbooks, edited 28 texts and contributed to over 370 book chapters. His seminal texts, Biomechanics of Spine Stabilization (1st, 2nd & 3rd Editions) and Spine Surgery: Techniques, Complications, Avoidance and Management (1st, 2nd & 3rd Editions) are conceivably the highlights of his publication endeavors.

Dr. Benzel holds ten patents and has participated in many medical advances. He is perhaps best known as an educator. He initiated and directed the Neurosurgery Residency Training Program, and the Spine Fellowship Programs at the University of New Mexico, and has been instrumental in the development and success of these programs at the Cleveland Clinic. His innovations in Neurosurgery Resident Education have won accolades and numerous awards. In February 2011, Dr. Benzel was chosen to receive the Paul C. Bucy Award for his exemplary efforts offering educational opportunities to his fellow neurosurgeons. Most recently, in 2013, Dr. Benzel was deeply honored by the acknowledgement for his “outstanding contribution to medical science worldwide” at the 13th Congress of Spine Surgery, Sao Paolo Brazil.

Look for Dr. Benzel during the following sessions!

8:00 – 11:30 AM
PC09 – Practical Spine Biomechanics for Clinical Practice, Course Director

8:00 – 11:30 AM
PC25 – The Advanced Practice Provider’s Guide to Integrating Innovation and Conventional Wisdom, Faculty

10:48 – 11:08 AM
Honored Guest Lecture

12:30 – 2:00 PM
M01: Honored Guest Luncheon

10:24 – 10:49 AM
Honored Guest Lecture
FEATURED SPEAKERS

WALTER E. DANDY ORATOR

Lars Olson, PhD
Professor of Neurobiology, Department of Neuroscience at Karolinska Institute

Lars Olson, PhD, a leading neuroscientist and researcher for decades, obtained his PhD at the Karolinska Institute in 1970. He has held his position as Professor of Neurobiology at Karolinska Institute since 1986, has served 11 years as department chairman, and has been a member of the Karolinska Nobel assembly. Olson is chairman of the board of the Swedish Brain foundation. Throughout his career, Olson has studied development, nerve growth factors, degeneration, regeneration and repair in the nervous system. His main research interests include models for Parkinson’s disease and its treatment, models for spinal cord injury and treatment strategies, monoamine neurons, development, growth factors, regeneration, aging, transplantation in the central nervous system, the roles of transcription factors in the nervous system and the Nogo signaling system. His research has been taken from animal studies to novel clinical trials, including therapeutic grafting to the human brain and delivery of NGF to the human brain. For his contributions, Professor Olson has been the recipient of several scientific awards. He has published papers every year since 1964, resulting in some 500 publications in neuroscience and is an original member of the ISI Highly Cited Researchers Database.

MICHAEL L.J. APUZZO LECTURER ON CREATIVITY AND INNOVATION

Philip Glass
Composer

Born in Baltimore, Maryland, Philip Glass is a graduate of the University of Chicago and the Juilliard School. He is considered one of the most influential music makers of the late 20th century.

In the early 1960s, Glass spent two years of intensive study in Paris with Nadia Boulanger and while there, earned money by transcribing Ravi Shankar’s Indian music into Western notation. By 1974, Glass had a number of innovative projects, creating a large collection of new music for The Philip Glass Ensemble and for the Mabou Mines Theater Company. This period culminated in Music in Twelve Parts and the landmark opera, Einstein on the Beach for which he collaborated with Robert Wilson.

Since Einstein, Glass has expanded his repertoire to include music for opera, dance, theater, chamber ensemble, orchestra and film. His scores have received Academy Award nominations and a Golden Globe.

Over the past few years, several new works were unveiled, including The Perfect American about the death of Walt Disney that premiered at the Teatro Real, Madrid in 2013 with additional performances by the English National Opera. Glass’ most recent opera Spuren de Verirrten, ‘The Lost’, premiered at the Landestheater Linz, Austria in 2013.
Cam Neely
President of the Boston Bruins

Cam Neely was named President of the NHL Boston Bruins in 2010 after serving as Vice President for three years. He oversees all of the club’s hockey and business operations and it was under his leadership that the Bruins were honored as the Sports Business Journal’s 2012 Sports Team of the Year.

A 2007 Hockey Hall of Fame inductee, Neely played 13 years in the NHL, the last ten with the Bruins. He retired in 1996 with 726 games played, 395 goals and 299 assists. He was an NHL All-Star from 1987 to 1996, and in 1994 won the NHL Bill Masterton Trophy as the player who best exemplified the qualities of perseverance, sportsmanship and dedication to hockey.

He has long been actively involved in many charitable efforts, including establishment of the Cam Neely Foundation for Cancer Care. The Foundation supports the Neely House, which provides housing and support for families of patients undergoing cancer treatments, the Neely Cancer Fund, whose initiatives include the Neely Center for Clinical Cancer Research, the Neely Cell Therapy and Collection Center and the Neely Pediatric Bone Marrow Transplant Unit.

Originally from Vancouver, British Columbia, Neely enjoys spending time with his wife and two children.

Michael D. Ensley, PhD
CEO, Executive Assessment Institute

Michael D. Ensley has created the ExecuSmart Suite of assessment tools and has dedicated himself to applying the “best science” to the process of talent management, executive coaching and executive assessment. Michael, along with his wife Rhonda Ensley, founded the Executive Assessment Institute, and he serves as the Chief Executive Officer. Michael is also a Visiting Professor at Ecole Polytechnique Federale Lausanne (EPFL) in Switzerland.

Prior to forming EAI, Michael was a Tenured Professor at Rensselaer Polytechnic Institute, where he served as the Area Coordinator and a Professor in the Management and Organization Group. During his tenure at RPI, Michael developed an approach to understanding an executive team’s impact on firm performance and systematically assessing and understanding executive talent. Prior to joining RPI, Michael was a Tenured Professor at the University of North Carolina at Charlotte where he focused on Business Strategy and Entrepreneurship.

Michael has published over 50 articles, made nearly 200 presentations and is published in the top academic journals in management and industrial psychology. His two most recent books soon to be published are Leadership Temperament and Building Team Impact. He has consulted at many organizations including Ford Motor Company, Oak Ridge National Laboratory, Pacific Northwest National Lab and National Renewal.
JOHN THOMPSON HISTORY OF MEDICINE LECTURER

Janne Sirén, PhD
Director, Albright-Knox Art Gallery

Dr. Janne Sirén assumed his appointment as the eleventh director of the Albright-Knox Art Gallery in April 2013. He comes to Buffalo from Helsinki, Finland, where he was Director of the Helsinki Art Museum – overseeing an active exhibitions, acquisitions, public art and museum development program.

From 2004 to 2007, Dr. Sirén served as Director of the Tampere Art Museum in southern Finland. From 2000 to 2004, he was Visiting Assistant Professor in the Department of Art History at The Hebrew University of Jerusalem, teaching courses in modern and contemporary art, aesthetics, museology and critical theory.

Dr. Sirén spent his collegiate career in the United States, earning a BA from College of the Holy Cross, and an MA and PhD from the Institute of Fine Arts at New York University. His research encompasses a broad range of artists and movements from the eighteenth century to the present.

Dr. Sirén is a passionate advocate for the active roles of the museum and the arts in society, particularly as they relate to the growth of communities. His current projects at the Albright-Knox include a major exhibition of work by Anselm Kiefer and a variety of new educational programs and community outreach initiatives.

ADMIRAL ERIC OLSON
Former Commander of the U.S. Special Operations Command
Retired Four-Star Navy SEAL Admiral

Eric Olson served as the commander of the U.S. Special Operations Command (USSOCOM) from 2007–2011. During his tenure as America’s top special operations officer, he was responsible for recruiting, training, equipping, and deploying broadly capable forces worldwide. Olson is often described as one of this century’s great military leaders and credited with developing the specialized forces that have accomplished some of the most notable military operations of the last decade. His personal operational experiences were diverse, marked by valor and strong leadership. Olson is also known as a visionary and action-oriented leader who stayed connected with his forces at all levels.

Olson’s actions as a Navy SEAL have been of national importance and utmost secrecy; many details of his operations are still classified. His career has included major, historic geopolitical events, and he was key to the successes of special operations forces in our recent conflicts.

Olson served in operational and leadership roles in which he developed many new tactics, techniques, and technologies. In addition to leading USSOCOM, Olson was commander of a counter-terrorism unit and later the Naval Special Warfare Command. Olson has also been awarded myriad military awards, and he has been recognized for his service by several civilian organizations and three foreign governments.
ANNUAL MEETING LEADERSHIP

PRESIDENT

Daniel K. Resnick, MD, MS

A native of Philadelphia and a persistent Eagles fan, Dr. Resnick is a summa cum laude graduate of Princeton University and graduated as a member of AOA from the University of Pennsylvania School of Medicine. Following an internship at Pennsylvania Hospital, he completed his residency training at the University of Pittsburgh. During residency, he earned a master’s degree in neuroscience based on spinal cord injury research and did an “infolded fellowship” at the University of New Mexico with this year’s Honored Guest, Dr. Edward C. Benzel. Focusing his career in spinal surgery, Dan joined the faculty at the University of Wisconsin where he is now Professor, Vice Chairman and Program Director. He has accrued numerous awards including the Dean’s teaching award for education of medical students.

His academic career began with an interest in spinal cord injury and he was part of the writing panel for the first cervical spine injury guidelines. This led to an interest in evidence based medicine and Dr. Resnick has been an advocate for and author of multiple guideline projects in spinal surgery and neurosurgery in general. Currently, his research interest is in comparative effectiveness research to inform and improve spine care and he has, as a consequence, become an advocate for spine surgeons and spine patients. He is currently Research Council Director for the North American Spine Society. He joined the Congress of Neurological Surgeons Executive Committee in 2001 and has served in a variety of posts, including Vice President, Treasurer and Chair of the Education Committee.

Dr. Resnick is immensely proud of his five children, Leah, Sabrina, Eli, Talia and Zev. He and his wife, Rachel, enjoy music, cycling and traveling (preferably in pursuit of music and cycling).

PRESIDENT-ELECT

Nathan R. Selden, MD, PhD

Dr. Selden is the Campagna Chair of Pediatric Neurosurgery at Oregon Health & Science University, residency Program Director and Vice-Chairman of Neurological Surgery.

Raised in Oregon, Dr. Selden graduated from Stanford University and Harvard Medical School and, as a Marshall Scholar, earned a doctorate from Cambridge University. He trained in neurosurgery at the University of Michigan and in pediatric neurosurgery at Northwestern University. In 2006, he performed the world’s first transplantation of neural stem cells in a human patient. He has also authored over 100 peer-reviewed articles.

Dr. Selden is Chair of the group that developed new educational outcomes measures for all US neurosurgery training programs, the ACGME Milestones. He also founded the Neurosurgery PGY1 Boot Camps, which are attended by all incoming U.S. neurosurgery residents, and received the ACGME Courage to Teach Award.

He has worked on the CNS Executive Committee since 2005, including as Secretary, and as Chair of the Annual Meeting and SANS Committees, and is also Chair of the Committee on Resident Education of the Society of Neurological Surgeons.

Dr. Selden is married to his medical school classmate, Dr. Karen Selden, a plastic surgeon. They enjoy skiing, rafting, and hiking in the Oregon Cascades as well as travel at home and abroad with their three children, Ryan, Lauren, and Megan.
ANNUAL MEETING CHAIR
Ashwini D. Sharan, MD

Ashwini D. Sharan, MD, is currently Professor in the Department of Neurosurgery and the Department of Neurology at Jefferson Medical College and Thomas Jefferson University. His practice focuses on neurostimulation neurosurgery, surgery for epilepsy and spinal neurosurgery.

In 1995, he completed his BA-MD degree from Boston University and UMDNJ - Newark, New Jersey in an accelerated medical program. He completed the majority of his training at Thomas Jefferson University in Philadelphia, Pennsylvania. Since then he has completed a fellowship in spinal neurosurgery and functional neurosurgery both at the Cleveland Clinic Foundation in Cleveland, Ohio.

In addition to his clinical work, Dr. Sharan is a true academician. He has been awarded the William H. Sweet Young Investigator Award and the William Buchhiet teacher of the year award.

Dr. Sharan is currently the Program Director of the Thomas Jefferson Neurosurgery Residency Program. He is Vice President and serves on the board of director of the North American Neuromodulation Society and Past President of the American Association of South Asian Neurosurgeons. He also serves on the Executive Committee of the Congress of Neurological Surgeons and is the 2014 CNS Annual Meeting Chairman.

SCIENTIFIC PROGRAM CHAIR
Elad I. Levy, MD, MBA

Dr. Elad Levy practices and lives in Buffalo, New York with his wife, Cindy and their three children, Bennett, 15, Hannon, 13 and Lauren, 9. He enjoys participating in triathlons, cycling, watching his children participate in sporting events; and Sundays are filled with family time. Recently, he has earned his MBA to focus on quality improvement in healthcare.

Dr. Levy is Professor and Chair of Neurosurgery at the State University of New York at Buffalo and is board certified. He is the Medical Director of Neuroendovascular Services at the Gates Vascular Institute (GVI), Co-Director of Kaledia Health Stroke Center and Cerebrovascular Surgery, and Director of Endovascular Stroke Treatment and Research.

He has published over 300 peer-reviewed publications and has been recently appointed as the editor for the Neurosurgery, endovascular section. He is the recipient of numerous awards for his research and contributions to the field.

In 2011, Dr. Levy founded and is President of the Program for Understanding Childhood Concussion and Stroke (PUCCS). His objective was to raise awareness of the effects of concussion. Dr. Levy believes, “There is little that is more gratifying than seeing our research and training translate into real advancements in medicine which help our community and patients across the globe.”

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ANNUAL MEETING COMMITTEE

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Elad I. Levy, MD, MBA

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Nicholas C. Bambakis, MD**
Peter Kan, MD, MPH, FRCSC
John Pollina, MD
Ciaran J. Powers, MD, PhD
Gregory R. Troost, MD
Jonathan H. Sherman, MD
Costas G. Hadjipanayis, MD, PhD
John K. Ratliff, MD

Neurosurgical Forum:
Paul A. Gardner, MD*
Johannathan A. Engh, MD
Jody Leonardo, MD
Edward R. Smith, MD

Practical Courses:
Brian Lim Hoh, MD**
Darlene Angela Label, MD, FAANS**
Alexander Arash Khalesli, MD, MS
Zachary N. Litvack, MD, MCR
Nader Pouratian, MD, PhD
Gregory R. Trost, MD

Luncheon Seminars:
Benard R. Bendok, MD, MSCI,
FAANS, FACS*
Pascal Jabbour, MD
Shivanand P. Lad, MD, PhD
Daniel M. Sciubba, MD

Dinner Seminars:
Ashok Rajappa Ashagiri, MD*
Renee M. Reynolds, MD
Parham Yashar, MD

Operative Neurosurgery:
Mustafa K. Baskaya, MD**
Paul A. Gardner, MD**
Aaron A. Cohen-Gadol, MD

Controversies/Hot Topics:
James S. Harrop, MD, FACS**
Alexander A. Khalesli, MD, MS**
Ricardo J. Komotar, MD
Julie G. Piltinis, MD, PhD
Ricardo A. Hanel, MD, PhD
Andrew J. Ringer, MD
John S. Kuo, MD, PhD
Travis M. Dumont, MD
Eral Veznedaroglu, MD

Symposia:
Sekhar N. Karpad, MD, PhD**
Brian Lim Hoh, MD**
Anan H. Siddiqui, MD, PhD
Domagoy Coric, MD
Peter Kan, MD, MPH, FRCSC
Steven A. Kalkanis, MD
Michael Y. Wang, MD, FACS

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Michael P. Steinmetz, MD

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Brian Lim Hoh, MD

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FACS, FRCSC
Frank LaMarca, MD
Lynda J. Yang, MD, PhD

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Konstantin V. Slavin, MD

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Andrew T. Parsa, MD, PhD
Jonas Sheehan, MD, FACS

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Andrea L. Strayer, MS, NP

* Indicates subcommittee Chair
** Indicates subcommittee Co-Chair
To help our attendees find and learn about the latest technological innovations in the exhibit hall, the CNS is introducing the Innovations Showcase during this year’s Annual Meeting in Boston. Stop by the Showcase, located at the entrance of the exhibit hall, to see the latest advances and new product launches.

Get your hands on the latest neurosurgical technology and find the industry-leading solutions that will move your practice forward. Join your colleagues and corporate contacts Monday through Wednesday in the Exhibit Hall.

Learn about breakthrough technological advances

» New! Innovations Showcase
» New! Sponsored Lunch Symposia
» Experience live demonstrations
» Live Surgical Presentations daily
» Demonstration Theater presentations during daily Beverage Breaks
» In-Booth Product Demonstrations

Network with your colleagues and make the most of your time in Boston:

» Digital Poster viewing
» New! CNS Foundation Silent Auction
» CNS Member Services

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SYM01: Cutting-Edge and Future Technology in Ischemic and Hemorrhagic Stroke

$250 A buffet lunch, and morning and afternoon coffee service are included in the registration fee.

Course Director(s): Peter Kan, Adnan Hussain Siddiqui

Symposium Description: This course provides a forum for attendees to obtain the latest information about EC-IC bypass, medical and interventional therapies, and optimal treatments of intracranial aneurysms, as well as discussing the best methods for patient selection and advance imaging for acute stroke intervention. Additionally, the critical care management of aneurysmal and subarachnoid hemorrhage and acute ischemic stroke will be covered.

Learning Objectives: Upon the completion of this symposium, participants will be able to:

■ Discuss recent literature on endovascular therapy for acute ischemic stroke and the latest intra-arterial stroke therapy.
■ Discuss recent literature on endovascular and surgical revascularization as well as best medical therapy for carotid artery disease.
■ Describe the optimal treatment of intracranial aneurysms and the latest endovascular aneurysm treatment.

Welcome
Peter Kan, Adnan Hussain Siddiqui

Intra-arterial Therapy for Stroke: The Latest Evidence and Ongoing Trials
J D. Mocco

How Can We Improve Outcomes in Acute Ischemic Stroke: Improvement of Door-to-Needle Time
Adam S. Arthur

How Can We Improve Outcomes in Acute Ischemic Stroke: Improvement of Patient Selection
Eric Sauvageau

The Role of Distal Protection in Acute Stroke Intervention
Pascal Jabbour

The Role of Stenting in the Era of Stentriever
Elad I. Levy

The Role of Thromboaspiration in the Era of Stentriever
Peter Kan

How to Build a Successful and Efficient Comprehensive Stroke Center
Andrew J. Ringer

Point/Counterpoint – High-grade Asymptomatic Carotid Stenosis: “Revascularization vs. Medical Management”
Ali Alaraj, Rafael Alexander Ortiz

Point/Counterpoint – Unruptured AVMs in the Post-ARUBA Era: “To Treat or Not to Treat”
Sepideh Amin-Hanjani, Michael T. Lawton

Carotid Endarterectomy vs. Carotid Artery Stenting: Where Do We Stand in the Post-CREST Era
Brian Lim Hoh

The Role of Embolic Protection in Carotid Artery Stenting
Mandy J. Binning

Newer Carotid Stents: Is There Still a Role for a New Carotid Trial
Peng R. Chen, Adnan H. Siddiqui

Point/Counterpoint – High-grade Asymptomatic Carotid Stenosis: “Revascularization vs. Medical Management”
Ali Alaraj, Rafael Alexander Ortiz

LUNCH BREAK

Flow Diversion in the Treatment of Intracranial Aneurysms: The Ongoing Pivotal Trials
Ricardo A. Hanel, Cameron G. McDougall

Intra-saccular Devices in the Treatment of Intracranial Aneurysms: A New Frontier
Erol Veznedaroglu

Surgical Management of ICH: The Latest Evidence and Ongoing Trials
Andrew Phillip Carlson

Endoscopic-assisted Aneurysm Surgery
A. Samy K. Youssef

Point/Counterpoint – MCA Aneurysms: Surgery vs. Endovascular Treatment
Demetrius K. Lopes, AJ Wakhloo

Point/Counterpoint – High-grade Asymptomatic Carotid Stenosis: “Revascularization vs. Medical Management”
Ali Alaraj, Rafael Alexander Ortiz

LUNCH BREAK

Flow Diversion in the Treatment of Intracranial Aneurysms: The Ongoing Pivotal Trials
Ricardo A. Hanel, Cameron G. McDougall

Intra-saccular Devices in the Treatment of Intracranial Aneurysms: A New Frontier
Erol Veznedaroglu

Surgical Management of ICH: The Latest Evidence and Ongoing Trials
Andrew Phillip Carlson

Endoscopic-assisted Aneurysm Surgery
A. Samy K. Youssef

Point/Counterpoint – MCA Aneurysms: Surgery vs. Endovascular Treatment
Demetrius K. Lopes, AJ Wakhloo
SYM02: Neuro-vation  CME is not offered for this course.

$250  A buffet lunch, and morning and afternoon coffee service are included in the registration fee.

Course Director(s): Brian Lim Hoh

Symposium Description: Engage in open dialogue about the future of cerebrovascular/endovascular, spine and brain tumor neurosurgery. Neuromedicine is among the most rapidly growing areas in surgery and medicine and novel technologies in devices, imaging, biomaterials, molecular diagnostics and regenerative medicine are leading this field forward.

This all-day open forum will include faculty of key thought-leaders in neurosurgery, chief executive officers, lead engineers and directors from the FDA with expertise in the cutting-edge technologies of the future in cerebrovascular/endovascular, spine and brain tumor neurosurgery. The open forum will enable participants, faculty and panelists to engage in free dialogue for the purpose of collectively pushing the field forward. Don’t miss this unique opportunity to be part of and have a voice in this important event in the field of innovation and technology in neurosurgery.

Learning Objectives: Upon completion of this course, participants will be able to:

■ Discuss innovative technologies in the pipeline in cerebrovascular/endovascular, spine and brain tumor neurosurgery.
■ Explain FDA governmental policies that help and hinder the development of medical technologies and devices.

DEVICES
Moderators/Panelists: Gene H. Barnett, Christopher Shaffrey, Henry Woo
Endovascular Shunt for Hydrocephalus
Carl B. Heilman
Micro Nerve Stimulator/Sensor
Matthew R. MacEwen
Nerve Stimulators
Nicholas M. Boulis
Wireless Optical Technology-Based ICP Monitor
Nikolaos Chronis
Biodegradable EcoG Array Made Out of Spider Silk
Brian Litt
Robot that Can Do Automated Craniotomies in Rodents and Non-Human Primates, by Integrating a Robotic Drill with an Impedance Sensor that Knows When You Hit Conductive Fluid
Ed Boyden
Robot to Perform Endovascular Surgical Clipping
Nobuhiko Hata
Neuromodulation
Daniel J. Dilorenzo
Neurolutions
Eric C. Leuthardt

BIOLOGICS
Moderators/Panelists: Roger Hartl, Mark Rosenblum, Robert Rosenwasser
Nerve Tubes
Robert J. Spinner

CSO Stem Cells Inc.
Stephen L. Huhn
High Through-Put Neurotechnology
Mehmet Fatih Yanik
Synthetic Neurobiology, Neural Circuit Computations
Ed Boyden

BUSINESS/VENTURE CAPITAL
Venture Capital
Bob Hopkins

DRUG DELIVERY
Moderators/Panelists: E. Antonio Chiocca, Ali R. Rezai, Konstantin V. Slavin
Nanoparticles
R. Loch MacDonald
Implantables for Sustained Postoperative Pain Control
Fred H. Geisler
Omniox
Stephen Cary
Magforce
Hoda Tawfik
Osteovantage
Eric C. Leuthardt

IMAGING
Moderators/Panelists: Bernard Bendok, Robert E. Gross, John Pollina
Siemens Innovations
Klaus Klingenbeck
Tumor MR Imaging Specialist
Kathleen M. Schmainda

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Keep all the CNS Annual Meeting information accessible with the Annual Meeting Guide

Access all of the details and stay connected throughout the CNS Annual Meeting with the Annual Meeting Guide using your iPhone, iPad, Android or Mobile Windows devices.

This guide includes:

- Course details – title, date, time, description, learning objectives, faculty and location
- Save your favorite sessions or events and create your own calendar
- Receive alerts and special announcements throughout the conference
- Send and receive messages with other meeting attendees
- Review the list of exhibitors and their location in the exhibit hall
- Request an appointment with an exhibitor
- Note taking ability on each of the sessions you attend
- And much more...

AVAILABLE IN FALL 2014

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AMBASSADOR

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as of 6/25/14
The CNS is pleased to welcome our 2014 International Partner – Israel Neurosurgical Society

Zeev Feldman, MD
President
Leon Levi, MD
Secretary
Menashe Zaaroor, MD
Zvi Harry Rappaport, MD
Leon Levi, MD
Mosh Hadani, MD

As the global leader in neurosurgical education, the CNS is pleased to announce CNS-SIM, back by popular demand! This course utilizes simulation based training techniques to educate neurosurgical residents in skills necessary to manage patients with traumatic brain injury, spine trauma and deformity, cerebrovascular disorders and skull based tumors. The course incorporates both didactic and hands-on training using state-of-the-art simulators, including virtual reality based and physical models. Participants can expect one-on-one training with faculty experts in the subspecialty modules.

*This course requires a $250 registration fee in order to guarantee a seat in the course. Upon completion of the course, the $250 registration fee will be refunded in its entirety. This course is for PGY3, PGY4 and PGY 5 residents.

Join us for this year’s CNS-SIM course –
PC19: Simulation Based Neurosurgical Training

Stay connected at http://m.cns.org
PRACTICAL COURSES

All 8:00 AM – 4:00 PM Practical Courses include a buffet lunch, and morning and afternoon coffee service. 8:00 – 11:30 AM and the 12:30 – 4:00 PM Practical Courses include coffee service.

SATURDAY

8:00 AM – 4:00 PM  $100
PC01: NINDS/CNS Workshop on Grant Writing and Career Development

General

Course Director(s): Stephen J. Korn
Faculty: Aviva Abosch, E. Antonio Chiocca, Aaron S. Dumont, Ernad N. Eskandar, Linda M. Liau, David D. Limbrick, Russell R. Lonser, J. Marc Simard, Kareem A. Zaghloul, Gregory J. Zipfel

Course Description: Balancing a research career and clinical neurosurgery is challenging. A key to success is to master the art of grant writing. This course is led by faculty who have successfully obtained funding from the National Institutes of Health (NIH) at different stages of their careers and faculty that sit or have sat on NIH study sections that review grants. Participants are encouraged to bring their own grant-in-progress; time will be set aside for the faculty to review these grants and provide individual instruction.

Learning Objectives: Upon completion of this course, participants will be able to:

■ Describe the methods for writing successful grants, for both the NIH and private foundations.

■ Discuss the steps to prepare grant applications based on tips and tricks that have helped others write successful grants.

8:00 AM – 4:00 PM  $650
PC02: Brain Tumor Update

Tumor

Course Director(s): Andrew T. Parsa, Jason P. Sheehan
Faculty: Manish Kumar Aghi, Nicholas C. Bambakidis, Frederick G. Barker, John A. Boockvar, Franco DeMonte, Michael Lim, Russell R. Lonser, Mark Edwin Shaffrey, Michael Edward Sughrue, Philip V. Theodosopoulos, Isaac Yang

Course Description: This course will include current research topics, and emphasizes practical management issues. It will provide an up-to-date overview of current management strategies for major types of glial tumors including astrocytomas, oligodendrogliomas and others. Treatment strategies for major types of benign and malignant brain tumors of non-glial origin will also be discussed.

Learning Objectives: Upon completion of this course, participants will be able to:

■ Formulate treatment plans based on the state-of-the-art management of benign and malignant brain tumors including meningiomas, acoustic neuromas, skull base tumors, pediatric tumors and metastases.

■ Incorporate current concepts in glioma management including surgical techniques, adjuvant treatments, tumor biology and clinical management decisions into their treatment plans.

8:00 AM – 4:00 PM  $1600
PC03: Minimally Invasive Spinal Surgery (Cadaver Course)

Spine

Course Director(s): Richard G. Fessler, John C. Liu
Faculty: Nader S. Dahdaleh, Vassilios Georgios Dimopoulos, Kurt M. Eichholz, Langston T. Holly, Robert E. Isaacs, Bong-Soo Kim, John E. O’Toole, Alfred T. Ogden, Avelino Parajon, Mick J. Perez-Cruet, Faheem A. Sandhu, Zachary Adam Smith, Trent L. Tredway, Jean-Marc Voyadzis

Course Description: This course will focus on minimally invasive procedures for cervical and lumbar spine surgery. Techniques for decompression, fixation and fusion will be discussed.

Learning Objectives: Upon completion of this course, participants will be able to:

■ Incorporate various minimally invasive techniques into their approach for cervical and lumbar spine surgery.

■ Identify the indications, results and potential complications for these procedures.

8:00 AM – 4:00 PM  $1600
PC04: Endoscopic and Keyhole Approaches to the Anterior Skull Base – Part 1 Keyhole Craniotomy and Endoscopic Assisted Microsurgery (Cadaver Course)

Tumor

Course Director(s): Daniel F. Kelly, Zachary N. Litvack

Course Description: This course is designed for neurosurgeons interested in adding minimally invasive endoscopic techniques to their practice. The full day clinic will provide a combination of didactic lectures, prosections and mentored hands-on practice in minimally invasive approaches to the Anterior, Antero-Lateral and Postero-Lateral Skull Base. Participants will have the opportunity to learn a number of approaches from faculty from around the world including the Supraorbital (“Eyebrow”) Craniotomy, Mini-Pterional Craniotomy, Keyhole Parasagittal, Keyhole-Retrosigmoid and Keyhole-Suprasellar with a focus on endoscopic visualization. Panel discussions will review indications and outcomes, along with “tricks of the trade”.

There are two registration options. For attendees opting for the "Didactic
+ Lab” course, a large portion of each block will be spent at the bench practicing the approaches with faculty mentors. Space is limited to 24 registrants for the lab. All attendees will participate in the didactics and have the opportunity to watch step-by-step prosections by the faculty for each segment of the course.

Learning Objectives: Upon completion of this course, participants will be able to:

■ Describe the 3-D relational anatomy of the anterior and posterolateral skull base as it applies to keyhole surgery.
■ Discuss indications for keyhole approaches and avoid common missteps and complications.
■ Demonstrate acquisition of new manual surgical skills in approach and dissection of the anterior cranial fossa.
■ Explain the role of new surgical instrumentation in advancing these surgical approaches.

8:00 AM – 4:00 PM $1600

PC05: Peripheral Nerve Anatomy and Surgery (Cadaver Course)

Peripheral Nerve

Course Director(s): Robert J. Spinner, Lynda Jun-San Yang

Course Description: This hands-on clinic uses cadaver dissection to review clinically relevant anatomy and surgical approaches to the brachial plexus and upper extremity nerves.

Learning Objectives: Upon completion of this course, participants will be able to:

■ Perform common exposures to normal nerves throughout the body.
■ Recognize relationships of nerves to potential sites of compression/injury.
■ Cite examples of commonly performed new techniques (e.g. nerve transfers).
■ Explain normal nerve anatomy in reconstructive efforts.
PRACTICAL COURSES

8:00 – 11:30 AM   $450
PC09: **Practical Spine Biomechanics for Clinical Practice**

Spine

Course Director(s): Edward C. Benzel, Tyler R. Koski
Faculty: John H. Shin, Robert G. Whitmore

Course Description: This course will present the physical principles and biomechanical foundations of spinal surgery and stabilization via a didactic and interactive case discussion format.

Learning Objectives: Upon completion of this course, participants will be able to:
- Integrate biomechanical principles and strategies into their surgical planning.
- Strategize to avoid and manage complications.

8:00 – 11:30 AM   $450
PC10: **Open Aneurysm Surgery: A 3-D Practical Course**

Vascular

Course Director(s): Michael T. Lawton, Byron Gregory Thompson

Course Description: This course will discuss optimal approaches for management of intracranial aneurysms.

Learning Objectives: Upon completion of this course, participants will be able to:
- Analyze case presentations of patients presenting with intracranial aneurysms to select the optimal (endovascular or microsurgical) approach.
- Interpret advanced preoperative imaging evaluation to maximize effectiveness of preoperative surgical planning.
- Plan for skull base approaches for anterior and posterior circulation aneurysm surgery in order to optimize exposure for complex aneurysms.
- Initiate adjunctive intraoperative imaging techniques to optimize obliteration of cerebral aneurysms with preservation of parent and branch vasculature.

8:00 – 11:30 AM   $450
**NEW**
PC11: **Update in Epilepsy Surgery**

Functional, Pediatrics

Course Director(s): William E. Ringaman
Faculty: Andreas Alexopoulos, Jorge A. Gonzalez-Martinez, Eldad J. Hadar, Gwyneth L. Hughes, Lara Jelih, Bradley Lega, Miguel Angel Lopez Gonzalez, Michael D. Sather, Nitin Tandon, Nicholas Michael Wetjen

Course Description: Surgery for epilepsy is an ever changing field with new science, new technology and new clinical trials. This course will cover the latest up-to-date science in epilepsy surgery. The course will be of interest to not only the epilepsy specialist, but also the general neurosurgeon who wants to learn the most current updates in epilepsy surgery.

Learning Objectives: Upon completion of this course, participants will be able to:
- Discuss the results of latest clinical trials in epilepsy surgery.
- Discuss the latest technological advances in epilepsy surgery.
- Discuss the latest in imaging advances in epilepsy surgery.

12:30 – 4:00 PM   $450
PC12: **3-D Anatomy (Infratentorial)**

General

Course Director(s): Juan Carlos Fernandez-Miranda, Albert L. Rhoton
Faculty: Evandro De Oliveira

Course Description: This course will provide three-dimensional microsurgical instruction on the anatomy and approaches through the temporal bone, cerebellum and fourth ventricle, far lateral and transcondylar approaches, approaches to the cerebellopontine angle and the anatomy and approaches to the jugular foramen.

Learning Objectives: Upon completion of this course, participants will be able to:
- Describe the anatomy of the temporal bone, cerebellum and fourth ventricle, far lateral and transcondylar approaches, approaches to the cerebellopontine angle and the anatomy and approaches to the jugular foramen.
- Discuss the three-dimensional neurovascular relationships of each region.

12:30 – 4:00 PM   $450
PC13: **Cervical Spondylotic Myelopathy and Radiculopathy: Treatment Approaches and Options**

Spine

Course Director(s): Regis W. Haid, Michael G. Kaiser
Faculty: Nathaniel P. Brooks, Kurt M. Eichholz, James S. Harrop, Langston T. Holly, John E. O’Toole

Course Description: This course will present the pathophysiology, clinical presentation and current diagnostic modalities involved in the care of cervical degenerative disease. The indications, techniques and complications associated with the operative management of cervical degenerative disease, including correction of degenerative deformities, will be reviewed through lectures, case-presentations and hands-on practical exercises.

Learning Objectives: Upon completion of this course, participants will be able to:
- Identify the appropriate indications and recommend state-of-the-art techniques for surgical management of degenerative disease of the cervical spine.
- Establish steps to avoid common complications.
PC14: Building a Comprehensive Stroke Center: Building a Program, Establishing a Center of Excellence and Achieving Joint Commission CSC Accreditation

Vascular
Course Director(s): Elad I. Levy, J. D. Mocco
Faculty: Bernard R. Bendok, Robert J. Dempsey, Adnan Hussain Siddiqui, Erol Veznedaroglu, Gregory J. Zipfel
Course Description: There are approximately 800,000 strokes in the United States each year. There is a call for accreditation of comprehensive stroke centers across the country to meet this national health care need. Participants will learn how to build a state-of-the-art stroke program, establish a stroke center of excellence and achieve Joint Commission CSC accreditation.
Learning Objectives: Upon completion of this course, participants will be able to:
■ Discuss standards and certification eligibility criteria for comprehensive stroke centers.
■ Review metrics and related data elements designed to monitor the quality of care at comprehensive stroke centers.

PC15: Cranial and Spinal Radiosurgery Update

Functional
Course Director(s): Randy L. Jensen, Andrew E. Sloan
Faculty: Steven D. Chang, Michael William McDermott, Alexander Muacevic, Jason P. Sheehan
Course Description: This course will discuss the appropriate use of various radiosurgery delivery platforms for benign and malignant cranial lesions.
Learning Objectives: Upon completion of this course, participants will be able to:
■ Recommend radiosurgery more safely by recognizing the appropriate use of radiosurgery for benign and malignant cranial lesions.

PC16: Neurocritical Care and Neurosurgical Emergencies Update

Trauma
Course Director(s): Jack Jallo, Christopher J. Madden
Faculty: Kamran Athar, Ian E. McCutcheon, John K. Ratliff, Jonathan A. White
Course Description: This course will promote rapid identification and a better understanding of the management of neurosurgical emergencies.
Learning Objectives: Upon completion of this course, participants will be able to:
■ Design key management strategies for emergencies involving the brain, spine and peripheral nerves.
■ Evaluate the current evidence for patient specific therapies.
■ Apply the latest modalities in the management and understanding of neurosurgical emergencies.
■ Identify controversies in management of these emergencies, considering the role of the surgeon in emergency neurosurgery.
■ Discuss the physiology of a variety of neurosurgical emergencies.

PC17: RRC Next Accreditation System, Milestones and the Neurosurgery Matrix

General
Course Director(s): Nathan R. Selden, Kim J. Burchiel
Faculty: Pamela L. Derstine
Course Description: This course will be particularly useful for Residency Program Directors, Associate Program Directors, Program Coordinators, Department Chairs and other faculty and educational leaders in academic neurosurgery centers. The course will cover the dynamic changes now occurring in the RRC Common Program Requirements and Neurosurgery Residency Program Requirements, the RRC Milestones Curriculum initiative and the Neurosurgery Matrix Curriculum. The faculty will include members of the Neurosurgery RRC, the ACGME and the Society of Neurological Surgeons Committee on Resident Education (CoRE). Time for questions and interactive discussion with panel members will be provided.
Learning Objectives: Upon completion of this course, participants will be able to:
■ Identify the principal new requirements for ACGME accredited neurological surgery residencies.
■ Describe the principal components of the ACGME Milestones teaching and assessment system.
PRACTICAL COURSES

All 8:00 AM – 4:00 PM Practical Courses include a buffet lunch, and morning and afternoon coffee service.
8:00 – 11:30 AM and the 12:30 – 4:00 PM Practical Courses include coffee service.

EXPANDED

PC18: Endoscopic Endonasal and Keyhole Approaches to the Skull Base – Part 2 Endoscopic Endonasal Skull Base Surgery (Cadaver Course)

Faculty:
- Garni Barkhoudarian
- Sarat P. Chandra
- Juan Carlos Fernandez-Miranda
- Sebastien Froelich
- Vikram C. Prabhu
- Jeremy D. W. Greenlee

Course Description:
This course utilizes this course, participants will be able to:
- Discuss indications for endonasal approaches and avoid common missteps and complications.
- Demonstrate acquisition of new manual surgical skills.
- Explain the role of new surgical instrumentation in advancing these surgical approaches.

Learning Objectives:
Upon completion of this course, participants will be able to:
- Describe the 3-D relational anatomy of the paranasal sinuses and ventral skull base as it applies to endonasal surgery.
- Discuss indications for endonasal approaches and avoid common missteps and complications.
- Demonstrate acquisition of new manual surgical skills.
- Explain the role of new surgical instrumentation in advancing these surgical approaches.

PC19: Simulation Based Neurosurgical Training

Faculty:
- Bernard R. Bendok
- James S. Harrop
- Darlene Angela Lobel
- Peter Campbell
- Rohan Chitale
- Aaron S. Dumont
- James Bradley Elder
- Aruna Ganju
- George M. Ghobrial
- Daniel J. Hoh
- Paschal Jabbour
- Thomas Kerwin
- Elad I. Levy
- J D. Mocco
- Gregory J. Murad
- Daniel M. Prevedello
- Wilson Zachary Ray
- Andrew J. Ringer
- Ben Z. Roitberg
- Gail Linskey Rousseau
- Clemens M. Schirmer
- Nathan R. Selden
- Warren R. Selman
- Adnan Hassain Siddiqui
- Harminder Singh
- Erol Veznedaroglu

Course Description:
This course utilizes simulation based training techniques to educate neurosurgical residents in skills necessary to manage patients with traumatic brain injury, spine trauma and deformity, cerebrovascular disorders and skull base tumors. The course incorporates both didactic and hands-on training using state-of-the-art simulators, including virtual reality based and physical models. Participants can expect one-on-one training with faculty experts in the subspecialty modules.

Learning Objectives:
Upon completion of this course, participants will be able to:
- Demonstrate proficiency using realistic simulators for craniotomy for trauma, placement of an external ventricular drain, cervical spine decompression and lumbar pedicle screw placement, repair of CSF leak, performance of cerebral angiogram and performance of retrosigmoid craniotomy.
- Interpret indications for and basic concepts and techniques in management of traumatic brain injury, degenerative spine disease, cerebrovascular disease and skull base tumors.

SUNDAY

8:00 AM – 4:00 PM
Part 2 Didactic + Lab $1600
Part 2 Didactic Only $500
Day 1 & 2: Lecture/Pro-section Only $500

NEW

PC20: So You're Finally a Neurosurgeon...Now What?

Faculty:
- Deborah L. Benzil
- Lawrence S. Chin
- Frederick A. Boop
- John D. Davis
- W. Christopher Fox
- Neil A. Martin
- Julie G. Pilitsis
- Richard P. Schlenk
- Krystal Lynne Tomei
- Luis Tumialan

Course Description:
Residency and fellowship training may prepare you with the neurosurgical knowledge and technical skills, but often this training does not prepare the neurosurgeon for the challenges and modern day issues of starting a practice, navigating the ever-changing medico-economic landscape of coding and reimbursement and the medico-legal environment. This course will be of interest to the young neurosurgeon just entering practice and also the experienced neurosurgeon who wants to learn about the current issues in practice-building, coding and reimbursement and medico-legal issues.

Learning Objectives:
Upon completion of this course, participants will be able to:
- Discuss issues of practice-building
for the neurosurgeon.

- Discuss current issues in coding and reimbursement for the neurosurgeon.
- Discuss medico-legal issues for the neurosurgeon.

8:00 – 11:30 AM $450

PC21: My Worst Spinal Complication: What I Learned

Spine

Course Director(s): Charles Kuntz, Christopher I. Shaffrey
Faculty: Robert Bohinski, Regis W. Haid, Laurence D. Rhines, Michael P. Steinmetz, Vincent C. Traynelis, Juan S. Uribe

Course Description: This course will present and review the avoidance, evaluation, pathophysiology, and treatment of surgical complications. Contemporary avoidance, evaluation, and management of surgical complications remain controversial. Despite significant medical advances, surgical complications can result in poor clinical outcomes and increased medical costs. There is a need for a better understanding of these surgical complications.

Learning Objectives: Upon completion of this course, participants will be able to:

- Integrate contemporary evaluation and pathophysiology recognition of spinal complications.
- Develop complication avoidance and management strategies for their current treatment plans.

8:00 – 11:30 AM $450

PC22: Surgical Management of Tumors in Eloquent Regions

Tumor

Course Director(s): Linda M. Liu, Guy M. McKhann
Faculty: Mustafa Kemal Baskaya, Andrew J. Fabiano, Isabelle M. Germano, Jorge Alvaro Gonzalez-Martinez, Andrew Morokoff

Course Description: This course will present surgical management of tumors within eloquent areas of the brain, including brain mapping, planning and avoidance of technical errors.

Learning Objectives: Upon completion of this course, participants will be able to:

- Identify the indications for surgical management of tumors within eloquent areas of the brain.
- Integrate current technologies for pre-operative and intra-operative brain mapping for tumors in eloquent cortex and fiber tracts into surgical planning by recognizing how they can enhance the safety of surgery, while considering their limitations.
- Strategize how to avoid common technical errors in brain mapping techniques.

8:00 – 11:30 AM $450

PC23: Implementing Quality Improvement in Neurosurgery: Raising Quality, Lowering Cost and Maximizing Compensation

Socioeconomic

Course Director(s): William A. Friedman, Nader Pouratian
Faculty: Anthony L. Asher, Stephen J. Haines, Dong H. Kim, Neil A. Martin, Nancy McLaughlin

Course Description: The course provides a comprehensive introduction to implementing quality improvement in a neurosurgical program or practice. While delivering quality care has always been an expectation, Medicare mandates and reimbursements, public reporting and evidence-based practice guidelines now require that physicians and neurosurgeons actively engage in the process of delivering and improving quality care. The goals of developing a quality improvement program are to optimize patient care using an evidence-based approach and to minimize the cost of health care, thereby providing the best value to patients and payors. Participants will learn in this interactive practical course that implementing quality improvement in neurosurgery requires recognition of evidence-based best-practice guidelines, models for implementations and continuous measurement to assess success and outcomes. In this course, participants will learn about the history of quality improvement and lessons learned from the aviation industry, which has made great strides in standardizing safety. Participants will also learn about complementary methods of clinical research and process improvement to improve patient outcome. The course will specifically explore the neurosurgical quality improvement landscape and areas for prioritization. Finally, participants will learn about how to increase value in neurosurgery, by cutting costs, decreasing waste and utilization, improving patient outcomes and satisfaction and leveraging these improvements to augment physician compensation.

Learning Objectives: Upon completion of this course, participants will be able to:

- Discuss how aviation industry quality improvements have been successfully applied in surgery.
- Explain the concept of “just culture.”
- Describe how to implement and sustain comprehensive value based quality improvement.
- Explain how to track clinical quality improvement.
- Apply concepts to cut costs, decrease utilization and thereby increase revenue and compensation.

8:00 – 11:30 AM $450

PC24: Building a Neurosciences Program

Socioeconomic

Course Director(s): Steven A. Toms
Faculty: Megan Brosious, James M. Eckland, Robert M. Friedlander, John B. Pracyk, John K. Ratliff, Adnan Hussain Siddiqui, Gary K. Steinberg

Course Description: The development of a neurosciences program is a complex enterprise involving the initiation and maintenance of a multitude of institutional and departmental relationships. Although there are significant advantages in an integrated neurosciences program, significant coordination and entry barriers can impede the program growth. This course will describe steps in neuroscience program development, differentiation and maturation in order to aid participants in launching and coordinating their

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PRACTICAL COURSES

All 8:00 AM – 4:00 PM Practical Courses include a buffet lunch, and morning and afternoon coffee service. 8:00 – 11:30 AM and the 12:30 – 4:00 PM Practical Courses include coffee service.

**EARN**
Additional CME with the SANS Annual Meeting Supplemental exams!

Continue your education after the Annual Meeting and earn one hour of additional CME credit with SANS supplemental exams! The supplemental exams for each of the following courses are available for only $15 each. Any Annual Meeting attendee can purchase – one or all – regardless of attendance at the live course.

**PRACTICAL COURSES**

PC04/PC18: Endoscopic and Keyhole Approaches to the Anterior Skull Base

**DINNER SEMINARS**

DIN01: Treating the One-level Cervical Disc Herniation with Radiculopathy: ACDF vs. Arthroplasty vs. Posterior Approach

DIN02: Emerging Technologies and their Role in the Clip Versus Coil Debate

DIN03: Evolving Strategies in Glioblastoma: Case-Based Presentations

**LUNCHION SEMINARS**

M06: Interactive Lunch: Neurooncology

M08: Interactive Lunch: Spine

T10: Interactive Lunch: Vascular

T11: Interactive Lunch: Pediatrics

own neuroscience programs.

Learning Objectives: Upon completion of this course, participants will be able to:

- Describe how a coordinated neuroscience program differs from a neurosurgery department or practice.
- Review the structures under which neuroscience programs can be formed.
- Discuss how neuroscience programs are necessary for hospital platforms and accountable care organizations.
- Assess mechanisms of neuroscience program governance.
- Analyze the methods by which neuroscience programs can differentiate a practice.
- Demonstrate the roles of research and quality metrics in developing a neuroscience program.

**NEW**

**PC26: Cranial Neurosurgery: Complication Avoidance and Management**

Vascular, Tumor

Course Director(s): William T. Couldwell, Jack P. Rock

Faculty: Ossama Al-Mefty, Gordon H. Baltuch, Robert H. Rosenwasser

Course Description: This course will use case presentations, didactic lectures and interaction with faculty to provide clinical scenarios that may result in complications. Appropriate management will be reviewed. Will discuss strategies designed to anticipate complications so that they may be avoided.

Learning Objectives: Upon completion of this course, participants will be able to:

- Identify common complications associated with a variety of cranial procedures.
- Plan strategies to avoid and manage them.

12:30 – 4:00 PM $450

NEW **PC27: The Advanced Practice Provider’s Guide to Integrating Innovation and Conventional Wisdom**

General

Course Director(s): Andrea L. Strayer, Eve C. Tsai

Faculty: Azam S. Ahmed, Edward C. Benzel, Marc Eichler, Durand Jones, Michael F. Nido, Nirav Patel, Joshua M. Rosenow, Kristina Shultz, Michael P. Steinmetz, Shelly D. Timmons

Course Description: The neurosurgery advanced practice provider (APP) is challenged with learning new innovations and specialty trends while staying abreast of day to day practice demands. The critical decision making skills and intellectual ability of APP’s in conjunction with the patient care needs and efficiency provides a cornerstone for neurosurgery practices. This practical clinic will explore innovation in neurosurgery, as well as trends and practice pearls. Additionally, how various innovations not only impact patient care, but also how APP’s are an integral part of neurosurgery trends and innovations.

Learning Objectives: Upon completion of this course, participants will be able to:

- Analyze a variety of neurosurgery innovations and trends and the practical integration into APP practice.
- Discuss pearls that will enhance the APP’s everyday practice.

8:00 – 11:30 AM $450

Complimentary for Advance Practice Provider Registrants

12:30 – 4:00 PM $450

NEW **PC27: Trauma Update: Traumatic Brain Injury**

Trauma

Course Director(s): Shelly D. Timmons

Faculty: Rocca Armonda, Prakash Sampath

Course Description: The modern management of traumatic brain injury (TBI) is ever-changing and complex. Current clinical trials are demonstrating new science while at the same time raising new controversies in the neurosurgical treatment of TBI. New technologies such as new monitoring devices and techniques are improving the neurosurgeon’s ability to take care of TBI patients. New and changing guidelines on TBI are important to every neurosurgeon. This course will
cover current clinical trials in TBI, new technologies and monitoring for TBI and the most up-to-date guidelines on TBI. This course will be interest not only to the neurosurgeon who takes care of TBI on a daily basis, but also to the general neurosurgeon who will want to learn the most up-to-date guidelines and management strategies for TBI.

Learning Objectives: Upon completion of this course, participants will be able to:
- Discuss current clinical trials in traumatic brain injury.
- Discuss new technologies and monitoring for traumatic brain injury.
- Discuss the most up-to-date guidelines on traumatic brain injury.

12:30–4:00 PM $450

PC28: 2014 CPT Coding Update
Socioeconomic

Course Director(s): Alexander Mason, John K. Ratliff
Faculty: Kim Pollock, Karin R. Swartz, Luis M. Tumialan
Course Description: This course summarizes the anticipated CPT 2014 coding changes and also reviews the 2014 coding changes that affect neurosurgeons.

Learning Objectives: Upon completion of this course, participants will be able to:
- Apply new and revised CPT coding concepts to key neurosurgical and reporting services with CPT codes and modifiers in order to effectively protect surgical and evaluation/management reimbursement.
- Strategize how to avoid compliance issues with regard to new regulations.

Learning Objectives: Upon completion of this course, participants will be able to:
- Describe principles of negotiation.
- Identify specific methods of maximizing chances of achieving goals during a negotiation.

12:30–4:00 PM $450

PC30: Information Technology, the Internet and Social Media Marketing to Enhance Your Neurosurgery Practice
Socioeconomic

Course Director(s): Chaim B. Colen
Faculty: Jordan P. Amadio, J. Brad Bellotte, David C. Berg, Brian T. Ragel, Benjamin P. Rosenbaum, Ann R. Stroink, Lindsay Thompson, Krystal Lynne Tomet
Course Description: The world is rapidly changing as IT advances include not only electronic medical record (EMR), but also smart phones and other applications that can improve the efficiency of your neurosurgery practice. The Internet and social media are the way patients now choose their doctors and hospitals. This course will educate participants on the latest in IT, EMR and using the Internet and social media to improve efficiency and enhance your practice.

Learning Objectives: Upon completion of this course, participants will be able to:
- Describe the impact of social media in medicine as it relates to neurosurgery.
- Discuss how to balance the use of social media to promote your practice while respecting HIPAA regulations and your own privacy.
- Discuss how to initiate the use of professional networking and social media when marketing your practice.

12:30–4:00 PM $450

PC29: Negotiation Tactics from the Experts – Getting the Best Deal (Hospital Negotiations)
Socioeconomic

Faculty: James M. Ecklund, Troy D. Payner, James T. Rutka
Course Description: This course will teach you the critical tools you need to effectively negotiate with your hospital administration. These strategies will also prove invaluable in many other negotiation environments.

Learning Objectives: Upon completion of this course, participants will be able to:
- Discuss current clinical trials in traumatic brain injury.
- Discuss new technologies and monitoring for traumatic brain injury.
- Discuss the most up-to-date guidelines on traumatic brain injury.

12:30–4:00 PM $450

NEW! PC30: Information Technology, the Internet and Social Media Marketing to Enhance Your Neurosurgery Practice
Socioeconomic

Course Director(s): Chaim B. Colen
Faculty: Jordan P. Amadio, J. Brad Bellotte, David C. Berg, Brian T. Ragel, Benjamin P. Rosenbaum, Ann R. Stroink, Lindsay Thompson, Krystal Lynne Tomet
Course Description: The world is rapidly changing as IT advances include not only electronic medical record (EMR), but also smart phones and other applications that can improve the efficiency of your neurosurgery practice. The Internet and social media are the way patients now choose their doctors and hospitals. This course will educate participants on the latest in IT, EMR and using the Internet and social media to improve efficiency and enhance your practice.

Learning Objectives: Upon completion of this course, participants will be able to:
- Describe the impact of social media in medicine as it relates to neurosurgery.
- Discuss how to balance the use of social media to promote your practice while respecting HIPAA regulations and your own privacy.
- Discuss how to initiate the use of professional networking and social media when marketing your practice.

12:30–4:00 PM $450

NEW! PC29: Negotiation Tactics from the Experts – Getting the Best Deal (Hospital Negotiations)
Socioeconomic

Faculty: James M. Ecklund, Troy D. Payner, James T. Rutka
Course Description: This course will teach you the critical tools you need to effectively negotiate with your hospital administration. These strategies will also prove invaluable in many other negotiation environments.

Learning Objectives: Upon completion of this course, participants will be able to:
- Discuss current clinical trials in traumatic brain injury.
- Discuss new technologies and monitoring for traumatic brain injury.
- Discuss the most up-to-date guidelines on traumatic brain injury.

12:30–4:00 PM $450

NEW! PC28: 2014 CPT Coding Update
Socioeconomic

Course Director(s): Alexander Mason, John K. Ratliff
Faculty: Kim Pollock, Karin R. Swartz, Luis M. Tumialan
Course Description: This course summarizes the anticipated CPT 2014 coding changes and also reviews the 2014 coding changes that affect neurosurgeons.

Learning Objectives: Upon completion of this course, participants will be able to:
- Apply new and revised CPT coding concepts to key neurosurgical and reporting services with CPT codes and modifiers in order to effectively protect surgical and evaluation/management reimbursement.
- Strategize how to avoid compliance issues with regard to new regulations.

ANSPA is holding its Fall CME meeting in conjunction with the CNS Annual Meeting in Boston, MA! ANSPA plans to offer neurosurgical lectures from top experts in the field. Breakfast and lunch are included with the registration fee.

NEW! ANSPA non-members will receive a one-year complimentary ANSPA membership with their Fall 2014 registration. Join us for CME and enjoy the benefits of ANSPA membership all year long!

Come to Boston to join your fellow PAs for a day of continuing education, networking and fun! For more information contact:

Rebecca Burns
ANSPA Meeting Planner
cme@anspa.org

Staying for the CNS Meeting?
If you are registered for the CNS meeting October 18-22, join us for a brand NEW course – PC25:
The Advanced Practice Provider’s Guide to Integrating Innovation and Conventional Wisdom. This practical course will explore innovations in neurosurgery, as well as trends and practice pearls. Additionally, how various innovations not only impact patient care, but also how APP’s are an integral part of neurosurgery trends and innovations. This $450 value is free to Advanced Practice Providers who are registered for the CNS Annual Meeting.
LUNCHEON SEMINARS

All Luncheon Seminars include a plated lunch served in the seminar room. Luncheon Seminar fees are $95 each ($75 for Residents/Fellows/Medical Students/Advance Practice Providers).

M01: Honored Guest Luncheon
Complimentary to CNS Resident Members!
Faculty: Edward C. Benzel
Introduction: Chair of CNS Resident Committee
Learning Objectives: Upon completion of this course, participants will be able to:
- Recognize the importance of leadership principles at various stages in a neurosurgeon’s career.
- Explain the principles of developing a rewarding career as a neurosurgeon in academic or community practice.
- Explain how to develop an effective mentor/mentee relationship in the early phase of establishing a practice.

M02: Athletic Head Injuries: Return to Play
Moderator(s): H. Hunt Batjer
Faculty: Julian E. Bailes, James M. Johnston, Russell R. Lonser, Jamie S. Ullman
Learning Objectives: Upon completion of this course, participants will be able to:
- Explain the potential consequences of athletic head injuries.
- Recognize concussion signs and symptoms.
- Discuss issues related to return to play after athletic head injury.

M03: Innovations in the Management of Intracerebral and Intraventricular Hemorrhage
Moderator(s): Issam A. Awad
Faculty: E. Sander Connolly, Neil A. Martin, Mario Zuccarello
Learning Objectives: Upon completion of this course, participants will be able to:
- Discuss natural history of intracerebral hemorrhage.
- Identify traditional surgical and new minimally invasive options for management of intracerebral hemorrhage.
- Interpret indications, outcomes, and complications from these approaches.

M04: MOC Preparation
Moderator(s): Ashok Rajapapp Asthagiri, Nader Pouratian
Faculty: Richard G. Ellenbogen, Mark N. Hadley, Russell R. Lonser, Mark Edwin Shaffrey, Konstantin V. Slavin, Daniel L. Surdell
Learning Objectives: Upon completion of this course, participants will be able to:
- Review key high yield topics for the ABNS MOC exam.
- Define the scope of material that is examined on the ABNS MOC exam.
- Identify critical learning resources for review for the ABNS MOC exam.

M05: Advances in the Management of Trigeminal Neuralgia and Facial Pain
Moderator(s): Kim J. Burchiel
Faculty: Douglas Kondziolka, Mark R. McLaughlin, Zvi Harry Rappaport, Joshua M. Rosenow, Johnathan A. White
Learning Objectives: Upon completion of this course, participants will be able to:
- Incorporate surgical, percutaneous, radiosurgical and neuromodulation strategies for managing difficult spinal pathologies.
- Discuss current controversies in spinal surgery.
- Review recent spine surgery guidelines.

M06: Interactive Lunch: Neuro-Oncology
SANS supplemental exam is available for this course for an additional $15.
Moderator(s): Charles Y. Liu, Christopher J. Shaffrey
Faculty: Patrick C. Hsieh, John E. O’Toole, Nicholas Theodore
Learning Objectives: Upon completion of this course, participants will be able to:
- Review innovative options for managing difficult spinal pathologies.
- Discuss current controversies in spinal surgery.
- Review recent spine surgery guidelines.

M07: Guidelines for Diagnosis and Treatment of Degenerative Lumbar Spinal Disease
Moderator(s): John Pollina,
Faculty: Zoher Ghogawala, Praveen V. Mummnameni, Daniel K. Resnick, Daniel M. Sciuinba
Learning Objectives: Upon completion of this course, participants will be able to:
- Assess the current literature on surgical treatment of degenerative lumbar spine disease.
- Analyze the indications and expected outcomes for various lumbar spine surgical procedures to improve their treatment plans.

M08: Interactive Lunch: Spine
SANS supplemental exam is available for this course for an additional $15.
Moderator(s): Charles Y. Liu, Christopher J. Shaffrey
Faculty: Patrick C. Hsieh, John E. O’Toole, Nicholas Theodore
Learning Objectives: Upon completion of this course, participants will be able to:
- Review innovative options for managing difficult spinal pathologies.
- Discuss current controversies in spinal surgery.
- Review recent spine surgery guidelines.

M09: Multidisciplinary Management of Subarachnoid Hemorrhage and Vasospasm
Moderator(s): Robert H. Rosenwasser
Faculty: E. Sander Connolly, Andrew J. Ringer, Daniel L. Surdell
Learning Objectives: Upon completion of this course, participants will be able to:
- Compare the current surgical, interventional and medical management of subarachnoid hemorrhage and vasospasm secondary to ruptured intracranial aneurysms and vascular malformations.
T10: Interactive Lunch: Vascular
SANS supplemental exam is available for this course for an additional $15
Moderator(s): Michael T. Lawton, Erol Veznedaroglu
Faculty: Adam S. Arthur, Daniel L. Barrow, Adnan Hussain Siddiqui
Learning Objectives: Upon completion of this course, participants will be able to:
■ Review the latest guidelines on treating neurovascular diseases.
■ Discuss innovative techniques and strategies for managing challenging neurovascular pathologies.
■ Discuss indications for treating neurovascular diseases.

T11: Interactive Lunch: Pediatrics
SANS supplemental exam is available for this course for an additional $15
Moderator(s): Richard G. Ellenbogen, Karin M. Muraszko
Faculty: Alan R. Cohen, Arthur James DiPatri
Learning Objectives: Upon completion of this course, participants will be able to:
■ Discuss the natural history and indications for treating pediatric neurosurgical diseases.
■ Review risk avoidance strategies in managing pediatric neurosurgical diseases.
■ Discuss the latest techniques and guidelines in managing pediatric neurosurgical pathologies.

T12: Cervical Arthroplasty and Lumbar Motion Preservation Technologies
Moderator(s): Regis W. Haid
Faculty: Domagoj Coric, Praveen V. Mummnani, Vedantam Rajshkekar, Michael Y. Wang
Learning Objectives: Upon completion of this course, participants will be able to:
■ Analyze the current state-of-the-art cervical disc arthroplasty technology.
■ Describe lumbar preservation technologies.
■ Determine indications for use of these technologies and potential complications.

T13: Guidelines for the Management of Acute Cervical Spine and Spinal Cord Injuries
Moderator(s): Mark N. Hadley
Faculty: Sanjay S. Dhall, R. John Hartlert
Learning Objectives: Upon completion of this course, participants will be able to:
■ Identify advances in the medical treatment of traumatic spinal cord injury.
■ Determine state of the art surgical management of cervical spine trauma and spinal cord injury.
■ Write protocols for identifying and assessing cervical spine injury in the comatose patient.

T14: Pituitary Adenomas: Operative Nuances and Management Considerations
Moderator(s): James J. Evans, Edward R. Laws
Faculty: Manish Kumar Aghi, James P. Chandler, Fred Gentili
Learning Objectives: Upon completion of this course, participants will be able to:
■ Explain the roles of medical, radiation and surgical treatment for secretory and non-secretory pituitary adenomas.
■ Describe the medical, imaging and laboratory evaluation for various pituitary adenomas.
■ Identify the surgical nuances of pituitary adenoma resection.

T15: New Frontiers and Innovations in Radiosurgery
Moderator(s): Douglas Kondziolka
Faculty: William A. Friedman, Ajay Niranjan, Jean M. Regis, Stephen B. Tatter
Learning Objectives: Upon completion of this course, participants will be able to:
■ List the various imaging tools used to assess radiosurgery responses.
■ Describe the expanded indications and new approaches for brain metastasis radiosurgery.
■ Discuss new concepts for trigeminal neuralgia radiosurgery.
■ Discuss new concepts for epilepsy radiosurgery.
■ Discuss new concepts for behavioral disorder radiosurgery.

T16: Managing Complications in Spinal Surgery
Moderator(s): Gregory R. Trost
Faculty: Michael W. Groff, Patrick W. Hitchon, John Pollina, Christopher I. Shaffrey
Learning Objectives: Upon completion of this course, participants will be able to:
■ Identify operative events dictating the need for intraoperative salvage techniques in spinal surgery.
■ Discuss the specific techniques necessary to rectify intraoperative difficulties.

T17: Guidelines for Neurocritical Care Management for Patients with Severe Traumatic Brain Injury
Moderator(s): Shelly D. Timmons
Faculty: Joshua E. Medow, Patricia B. Raksin
Learning Objectives: Upon completion of this course, participants will be able to:
■ Assess current practice standards, and practical issues surrounding management.
■ Identify the unique challenges facing patients with traumatic brain injury.
<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Moderator(s)</th>
<th>Faculty</th>
<th>Learning Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>T18</td>
<td>Peripheral Nerve Board Review</td>
<td>Lynda Jun-San Yang</td>
<td>Allen H. Maniker, Rajiv Midha, Robert J. Spinner</td>
<td>Discuss the important peripheral nerve injuries frequently presented on board examinations. Demonstrate comprehension of the peripheral nerve physical examination. Explain how to manage peripheral nerve injury/disease surgically and non-surgically.</td>
</tr>
<tr>
<td>W19</td>
<td>Incorporating Telemedicine into Your Practice</td>
<td>Adnan Hussain Siddiqui</td>
<td>Pascal Jabbour</td>
<td>Explain technological and infrastructure requirements of telemedicine systems. Discuss the impact of telemedicine on healthcare delivery. Learn about the legal and financial issues related to telemedicine.</td>
</tr>
<tr>
<td>W21</td>
<td>Multidisciplinary Management Strategies for Unruptured Aneurysms</td>
<td>Robert A. Solomon</td>
<td>Felipe Albuquerque, Robert M. Friedlander, Juha Antero Hernesniemi, Byron Gregory Thompson</td>
<td>Discuss the epidemiology and natural history of unruptured intracranial aneurysms. Construct appropriate treatment algorithms for these lesions.</td>
</tr>
<tr>
<td>W23</td>
<td>Hematology and Coagulation for Neurosurgeons: Dangers and Solutions</td>
<td>Issam A. Awad</td>
<td>Alan S. Hoffer, Pascal Jabbour, R. Loch Macdonald</td>
<td>Discuss that neurosurgeons commonly face acute peri- and intraoperative decisions regarding the diagnosis and management of coagulopathy that are crucial to patient safety and excellent outcomes. Review important coagulation mechanisms, parameters, indications and clinical pearls to their current strategy. List important screening guidelines and define the key points of emergency and intraoperative coagulation management.</td>
</tr>
<tr>
<td>W24</td>
<td>Peripheral Nerve Entrapment Syndromes: Diagnosis and Management</td>
<td>Eric L. Zager</td>
<td>Jason H. Huang, Robert J. Spinner, Lynda Jun-San Yang</td>
<td>Explain the diagnosis and workup of peripheral nerve entrapment syndromes. Review surgical indications of these syndromes. Discuss complication avoidance in the management of these syndromes.</td>
</tr>
</tbody>
</table>
DINNER SEMINARS
Saturday, October 18  6:00–8:30 PM

DIN01: Treating the One-level Cervical Disc Herniation with Radiculopathy: ACFD vs. Arthroplasty vs. Posterior Approach

SANS supplemental exam is available for this course for an additional $15

Course Director(s): Praveen V. Mummaneni
Faculty: Domagoj Coric, Mark Edwin Shaffrey, Michael Y. Wang

Course Description: For years, the question of how to surgically approach the one-level disk herniation presenting with refractory radiculopathy has been a matter of clinical equipoise influenced mostly by regional practice patterns, reimbursement and surgeon preference. Are there clear and refined indications for each approach? Enjoy a fantastic dining opportunity while engaging experts in the field present their views and debate their approaches via case-based presentations.

Learning Objectives: Upon completion of this course, participants will be able to:
- List the surgical options for treatment of cervical radiculopathy.
- Assess contraindications to cervical arthroplasty.
- Describe the management benefits and indications for cervical, foraminotomy/posterior diskectomy, arthrodesis and arthroplasty.

AGENDA
Introduction
Praveen V. Mummaneni

Anterior Cervical Diskectomy and Fusion
Michael Y. Wang

Disk Arthroplasty
Domagoj Coric

Foraminotomy and Diskectomy
Mark Edwin Shaffrey

Case Presentations and Discussion

Smith and Wollensky
Located between the new Rose Kennedy Greenway and historic Boston Harbor, Smith and Wollensky offers a breathtaking waterfront view. The 10,000-square-foot steakhouse includes an outdoor patio, bar and lounge, adding to the restaurant’s unique Harbor experience. The European-style exposition kitchen provides culinary entertainment while lush furnishings of wood and leather create a cozy and inviting interior retreat.

Honored by 2013 Wine Spectator for 6th year in a row.

Mistral
Located in Boston’s stylish South End, Mistral showcases uncomplicated French cuisine, highlighted with the season’s finest ingredients. Inspired by the wind that sweeps through the south of France, their decor is reminiscent of Provence, with handpicked pottery and arched windows that evoke warmth and sophistication.

Named “Top 25 New Restaurants in America” by Esquire Magazine, and winner of four “Best of Boston” awards from Boston Magazine.
DINNER SEMINARS
Monday, October 20    6:00 – 8:30 PM

DIN03:  Evolving Strategies in Glioblastoma: Case-Based Presentations

SANS supplemental exam is available for this course for an additional $15

Course Director(s): Robert Fenstermaker
Faculty: Michael William McDermott, Lazslo Mechtler, Nader Sanai, Michael A. Vogelbaum

Course Description: The therapeutic landscape in the management of glioblastoma has been evolving rapidly over the last 10 years with a wide breadth of novel treatment strategies undergoing pre-clinical and clinical testing. In addition to reviewing standard of care in the treatment of glioblastoma, leading experts will present controversial management issues and discuss evolving therapies.

Learning Objectives: Upon completion of this course, participants will be able to:
- Describe the standard of care for newly diagnosed patients with suspected GBM.
- Discuss the current evidence supporting various novel adjuvant treatments in the treatment of GBM.
- Discuss the evolving use of various surgical methods and technologies in the operative management of GBM. (i.e. awake craniotomy, iMRI, etc.).

AGENDA
Introduction
Robert Fenstermaker

Extent of Resection
Nader Sanai

Clinical Trials Update
Michael A. Vogelbaum

Novel Treatment Paradigms for Glioblastoma
Michael William McDermott

Case Presentations and Discussion

Grill 23

For 30 years, Grill 23's mission has been to deliver world-class service and the best available product to their guests including all-natural meats, dayboat seafood and local produce from sustainable farms. Since 2003, Executive Chef Jay Murray has exclusively served USDA Prime, all-natural, source verified, humane beef from Brandt Beef in California. Everything they serve at Grill 23 delivers the best quality and flavor possible to our guests.


Strega

The Strega phenomenon exploded in 2003 with the opening of restaurateur Nick Varano’s now legendary North End Landmark. Strega quickly became famous for its dramatic door, celebrity clientele, unmatched hospitality and unforgettable cuisine. Doors were officially opened in 2010, becoming Boston’s foremost dining destination with breathtaking oceanfront views, dazzling interiors with a new twist on Italian Cuisine.

American Express’ Executive Travel: Boston’s Best Restaurants.
DINNER SEMINARS
Tuesday, October 21  6:00 – 8:30 PM

6:00 – 8:30 PM  Price: $190
DIN05: Social Media: Balancing Your Practice’s Needs with Your Privacy
Course Director(s): Brian Lim Hoh
Faculty: Chaim B. Colen, Nelson M. Oyesiku, Nader Pouratian, Brian T. Ragel, Lindsay Thompson
Course Description: Tweet. Poke. RSS feeds. LinkedIn. The currency of engaging patients in healthcare decisions and the outward face of your practice is radically changing. With the expanding footprint of social media in our everyday lives, an expert panel will deliver the pros and cons of incorporating social media into your practice, as well as some of the details on how to get started.
Learning Objectives: Upon completion of this course, participants will be able to:
■ Describe the impact of social media in medicine as it relates to neurosurgery.
■ Discuss how to balance the use of social media to promote your practice while respecting HIPAA regulations and your own privacy.
■ Discuss how to initiate the use of professional networking and social media in your practice.

AGENDA
Introduction
Brian Lim Hoh

The Science of Social Media
Lindsay Thompson

Pearls and Pitfalls in Social Media
Chaim B. Colen

Tweeting, Facebook and Webinars: Reaching and Teaching Potential Patients
Nader Pouratian

Social Media in Organized Neurosurgery
Brian T. Ragel

Discussion

6:00 – 8:30 PM  Price: $190
DIN06: The New Standards: Outcome Measures in Neurosurgery
Course Director(s): Anthony L. Asher
Faculty: Zoher Ghogawala, John J. Knightly, Matthew J. McGirt, Timothy C. Ryken, Nicholas Theodore
Course Description: With support from Congress, a Patient-Centered Outcomes Research Institute (PCORI) was established in 2010 and has taken comparative clinical effectiveness research to the forefront of public attention. Join leading experts who have participated extensively in outcomes database development and utilization in neurosurgery discuss (1) its overall purpose and (2) how you can incorporate outcome measures into your practice.
Learning Objectives: Upon completion of this course, participants will be able to:
■ Describe the role of outcomes assessment for the profession of neurosurgery.
■ Discuss how to participate in outcomes assessment.
■ Discuss the implications of measuring outcomes in the changing healthcare system.

AGENDA
Introduction
Anthony L. Asher

The National Neurosurgery Quality and Outcomes Database
Matthew J. McGirt

An Interactive Spine Registry
Zoher Ghogawala

The Importance of Data Fidelity in Calculating Quality Metrics
John J. Knightly

Translating Guidelines into Outcomes Assessment
Nicholas Theodore

Future Directions in Neurosurgical Outcomes Research
Timothy C. Ryken

Discussion

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Empire
Located in the heart of Fan Pier in the Seaport District, Empire, Restaurant & Lounge transports you into the mystics of Asia. Bathed in bright turquoise, oranges and gold and punctuated with intricate patterns, plush fabrics and exotic Asian art, the sleek, modern space is designed to give guests an old world feel with a touch of Hong Kong mystery.

2012 Award Winner for Boston Eater.

Towne
Towne Stove and Spirits is a warm, welcoming respite in Boston’s bustling Back Bay. It’s a place where all are welcome and the savory scents from their wood-fired rotisserie mix with the hearty sounds of laughter and good conversation. A place where people relax and enjoy culinary surprises from around the globe.

Trip Advisors Certificate of Excellence Award 2013.

Stay connected at http://m.cns.org

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INTERNATIONAL COLLEAGUES!

Don’t miss the 2014 International Reception!

Enjoy cocktails and hors d’oeuvres at this networking opportunity exclusively for our colleagues throughout the world. Taking place at the historic Boston Tea Party Museum.

Saturday, October 18, 2014, 5:00 - 6:30 PM.

All international attendees and their guests are invited to attend. Complimentary transportation from the Headquarter Hotel will be provided.

ALSO join us for the International Forum on Monday, October 20, 2014, 4:15 - 5:30 PM, showcasing cutting edge breakthroughs from around the globe.
1:00 – 3:00 PM
CNS RESIDENT SANS CHALLENGE PRELIMINARY ROUND

Back by popular demand, this year’s challenge will keep the Are You Smarter Than...? format. Audience participation is encouraged!

1:30 – 4:00 PM
CHOICE ABSTRACTS: SPANNING THE SPECTRUM OF NEUROSURGERY
Moderator(s): Krystal Tomei
Learning Objectives: Upon completion of this course, participants will be able to:
- Inspect 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.

1:06 – 1:12 PM
101 Reoperation Rates after Anterior Cervical Discectomy and Fusion Versus Posterior Cervical Foraminotomy: A Propensity Matched Analysis
Daniel Lubelski, Andrew T. Healy, Michael Silverstein, Michael P. Steinmetz, Edward C. Benzel, Thomas E. Mroz

1:42 – 1:48 PM
102 Predictors of spinal cord stimulation success
Priscilla De La Cruz, Steven G. Roth, Joannalee C. Campbell, Jessica Haller, Meghan Wilock, Steven Lange, Julie G. Pitllitis

1:48 – 1:54 PM
103 Stereotactic Laser Amygdalo-Hippocampectomy for Mesial Temporal Lobe Epilepsy: Collective Experience from Seven Single-Center, Prospective, Investigator-Initiated Studies

1:54 – 2:00 PM
104 Design and Evaluation of a Concentric Tube Robot for Minimally-Invasive Endoscopic Pediatric Neurosurgery
Vivek Pankaj Bodani, Hamidreza Azimian, Thomas Lool, James M. Drake

2:00 – 2:06 PM
JOURNAL OF NEURO-ONCOLOGY AWARD
105 The Effect of Timing of Radiotherapy (RT) in Patients with Newly-diagnosed Glioblastoma Multiforme (GBM) Receiving Temozolomide (TMZ): An Analysis Based on the UCSF Experience
Seungsu J. Han, William Caleb Rutledge, Annette Molinaro, Susan Chang, Jennifer L. Clarke, Michael Prados, Mitchel S. Berger, Nicholas Butowski

2:06 – 2:12 PM
106 Verification of Spinal Cord Decompression by Pre and Post-operative Magnetic Resonance Imaging in Traumatic Sub-axial Spinal Cord Injuries
Bizhan Aarabi, Noori Akhtar-Danesh, David Hersh, Elizabeth J. Le, Jennifer M. Massetti, Cara Diaz

2:12 – 2:18 PM
107 Supporting A Culture of Quality: Integration of a Self-reported Adverse Event Tracking System into an EPIC-based Electronic Health Record at an Academic Institution
Paul L. Penar

2:18 – 2:24 PM
108 Cerebral Revascularization in the Endovascular Era: Clinical Indications, Surgical Results and Outcomes at the Barrow Neurological Institute
Leonardo Rangel-Castilla, M. Yashar S. Kalani, Jonathan Russin, Wyatt Ramey, Justin C. Clark, Peter Nakaji, Joseph Zabramsky, Robert F. Spetzler

2:24 – 2:30 PM
109 Defining the Effectiveness of Lumbar Spine Surgery in a Nationwide, Prospective Longitudinal Quality of Life Registry: An Analysis of Variability in Patient-reported Outcomes and Preliminary Predictive Models of Treatment Failure
Wesley E. Griffitt, Troy M. Tippett, Jeffrey W. Cozzens, Lana D. Christiano, Thomas W. Graham, Barton L. Guthrie, J. Frederick Harrington, Christopher I. Shaffrey, Eric H. Elowitz, Kevin T. Foley, Clarence B. Watridge, Anthony L. Asher

2:30–2:36 PM
110 Implementation of a Standardized Multimodal Post-Operative Pain Protocol Reduces Post-Operative Pain Among Neurosurgical Patients
William Lee Titsworth, Justine Abram, Peggy Gain, Jennifer Bushwitz, Robert Hurley, Christoph Seubert, William A. Friedman

2:36–2:42 PM
111 In-vivo Performance of a Microfabricated Catheter for Intraparenchymal Delivery
Martin Brady, Deep Singh, Pj Anand, Adam Fleisher, William C. Broaddus, Jaime Mata, Willam Olbricht, Raghu Raghavan

2:42–2:48 PM
112 Shunt Survival Benefit Associated with Complete Versus Partial Revision
Jonathan Jay Stone, Corey Walker, Minal Jain, Maxwell Jacobson, Valerie Phillips, Howard J. Silberstein

2:48–2:54 PM
SYNTHES SKULL BASE SURGERY AWARD
113 Long-term Follow-up of Male Patients with Prolactinomas: Is Bone Densitometry Necessary?
Lukas Andereggen, Janine Frey, Robert H. Andres, Marwan El-Koussy, Emanuel Christ, 2:54–3:00 PM
114 Risk Factors for Post-Concussion Syndrome in an Exclusively Sport-Related Concussion Group: Case Control Study
Clinton David Morgan, Scott L. Zuckermand, Young Min Lee, Gary Solomon, Allen K. Sills

3:00–3:06 PM
115 Risk Factors for Laminectomy Surgical Site Infection in a Majority Minority Patient Population
Antebiet-Abasi U. B. Udofia, Tolulope Oyetunji, Damirez Fossett

3:06–3:12 PM
116 Resolution of Cranial Neuropathies Following Treatment of Intracranial Aneurysms with the Pipeline Embolization Device
Karam Moon, Felipe Albuquerque, Andrew F. Ducruet, R. Webster Crowley, Cameron G. McDougall

3:12–3:18 PM
117 Outcomes of Operative and Nonoperative Treatment for Adult Spinal Deformity (ASD): A Prospective, Multi-Center Matched and Unmatched Cohort Assessment with Minimum 2-Year Follow-Up

3:18–3:24 PM
118 Fully Endoscopic Microvascular Decompression (E-MVD) for TN, a Safe and Effective Procedure
John Thomas Pierce, Leif-Erik Bohman, Sukmeet Sandhu, Marie Kerr, John Y.K. Lee

3:24–3:30 PM
119 Spatial Conflict is Encoded in Human MT+
Charles B. Mikell, Elliot H. Smith, Lauren Terese Brown, Gay M. McKhann, Sameer A. Sheth

3:30–3:36 PM
120 Change in Optic Nerve Sheath Parameters Are a Sensitive Radiological Marker of ETV Outcome in Children
Llewellyn Padayachy, Graham A. G. Figgen, Henri Carrara, Anthony Figaji

3:36–3:42 PM
PREUSS AWARD
121 Leptomeningeal Dissemination Cascade in Medulloblastoma
Ricky Raj Singh Kalra, Daniel W. Fults

3:42–3:48 PM
122 Risk Factors for Aseptic Bone Necrosis Following Cranioplasty: A Multivariate Analysis After Reinsertion of 500 Bone Flaps
Christian Ewald

3:48–3:54 PM
123 Establishing Standard Performance Measures in Adult Traumatic Brain Injury Patients: A Nationwide Inpatient Sample Database Study
Brian M. Corliss, Kristopher G. Hooten, Sarah Shireen Gul, Dan Neal, Gregory J. Murad, Maryam Rahman

3:54–4:00 PM
204 Simvastatin in Aneurysmal Subarachnoid Hemorrhage (STASH) Trial: A Clinical Phase 111 Randomized Placebo Controlled Trial – The Results
Carole L Turner, Christopher Smith, Gordon D. Murray, Peter J. Hutchinson, Peter J. Kirkpatrick

3:54–4:00 PM
204 Simvastatin in Aneurysmal Subarachnoid Hemorrhage (STASH) Trial: A Clinical Phase 111 Randomized Placebo Controlled Trial – The Results
Carole L Turner, Christopher Smith, Gordon D. Murray, Peter J. Hutchinson, Peter J. Kirkpatrick
Opening Reception  
SUNDAY, OCTOBER 19  
6:45 - 8:30 PM

Join your friends and colleagues for an evening of fun with live music, delectable fare and luscious libations at the 2014 CNS Opening Reception. No need to travel, your treats await you at the convention center for your convenience and pleasure.

See you there!
11:45 AM – 12:15 PM
LIVE SURGERY IN THE EXHIBIT HALL
Expanded Endonasal Endoscopy
Operating: Paul A. Gardner
Moderators: James K. Liu, Jacques J. Morcos

2:00 – 3:30 PM
HOT TOPICS
The Management of Concussion in Children and Young Adults
The Balance Due: Payment for Neurosurgeons
Practical Guide to the Current Health Delivery System

2:00 – 3:30 PM
CONTROVERSIES
Extent of Resection of Benign Skull Base Tumors
Neo-adjuvant Radiosurgery Followed by Resection of Brain Metastases: Yes vs. No

4:15 – 5:30 PM
CONSENSUS SESSIONS
Management of Gliomas
- Low Grade Gliomas
- High Grade Gliomas
- Impact of Genetics
- Multimodality Treatment
7:00 – 8:30 AM
SECTION SESSIONS

SECTION ON TUMORS
EMERGING TECHNOLOGIES IN TUMOR VISUALIZATION AND THERAPY
Moderator(s): Steven N. Kalkanis, John S. Kuo
Faculty: Aaron A. Cohen-Gadol, Edward R. Laws, David W. Roberts, Nader Sanai, Michael A. Vogelbaum
Learning Objectives: Upon completion of this course the participant will be able to:

■ Discuss the current molecular/cellular concepts of tumor extent of resection.
■ Apply fluorescence-guided applications to surgeries for gliomas, meningiomas, pituitary tumors.
■ Describe new preclinical technologies in tumor visualization and therapy.

7:00 – 8:12 AM
管理委员：Steven N. Kalkanis, John S. Kuo
学習目標：参加者は以下の能力を身に付けることができるものとする。
■ 脳腫瘍の切除範囲と切除の分子/細胞概念を議論する。
■ 高度悪性脳腫瘍に対するフローセル原子を用いた手術を応用する。
■ 新しい予備実験技術で脳腫瘍の視覚化と療法を説明する。

7:00 – 7:07 AM
What Defines Glioma Margins and Extent of Resection
Michael A. Vogelbaum

7:12 – 7:24 AM
Fluorescence-guided Resection (FGR) for High Grade Gliomas
Aaron A. Cohen-Gadol

7:24 – 7:36 AM
Fluorescence-guided Resection (FGR) for Low Grade Gliomas
Nader Sanai

7:36 – 7:48 AM
FGR for Meningiomas
David W. Roberts

7:48 – 8:00 AM
FGR for Pituitary Tumors
Edward R. Laws

8:00 – 8:12 AM
Preclinical Concepts: Potential Intraoperative Application of Raman Spectroscopy
Steven N. Kalkanis

8:12 – 8:24 AM
Preclinical Concepts: Alkylphosphocholine Analogs for Tumor Detection and Therapy
John S. Kuo

8:24 – 8:30 AM
Discussion

SECTION ON PAIN
MANAGEMENT OF CANCER PAIN
Moderator(s): Jason M. Schwalb, Ashwin Viswanathan
Speakers: Jonathan Miller, Alon Y. Mogilner, Sean J. Nagel, William S. Rosenberg
Learning Objectives: Upon completion of the section meeting the attendee will be able to:

■ Review current evidence of the use of intrathecal pumps for cancer pain.

7:00 – 7:20 AM
Ablation for Cancer Pain
Alon Y. Mogilner

7:20 – 7:40 AM
Neuromodulation for Cancer Pain
Jonathan Miller

7:40 – 8:00 AM
Intrathecal Pumps
Sean J. Nagel

8:00 – 8:20 AM
Complex Cancer Cases
William S. Rosenberg

8:20 – 8:30 AM
Panel Discussion

SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES
SPINAL PATHOLOGY: ALWAYS A QUESTION OF BALANCE
Moderator(s): Tyler R. Koski, Christopher I. Shaffrey
Speakers: Peter D. Angevine, Robert F. Heary, Frank LaMarca, Praveen V. Mummaneni, Daniel M. Sciubba, Juan S. Uribe
Learning Objectives: Upon completion of this session the attendee will be able to:

■ Discuss the implications of spinal balance in all types of surgical spinal pathology.
■ Explain the importance of pelvic parameters on spinal balance.
■ Describe techniques to help address/avoid problems of spinal imbalance.

7:00 – 7:14 AM
Why Does Spinal Balance Matter in the Case of Basic Degenerative Spinal Pathology?
Robert F. Heary

7:15 – 7:29 AM
Importance of Pelvic Parameters in Assessing Spinal Balance
Praveen V. Mummaneni

7:30 – 7:44 AM
Does Coronal Balance Matter When Addressing Adult Spinal Pathology?
Peter D. Angevine

7:45 – 7:59 AM
When and How Does Global Spinal Balance Affect the Cervical Spine
Frank LaMarca

8:00 – 8:14 AM
Challenges of Addressing Spinal Balance with Minimally Invasive Surgical Techniques
Juan S. Uribe

8:15 – 8:29 AM
Proximal Junctional Kyphosis: Can Anything Be Done?
Daniel M. Sciubba

SECTION ON NEUROTRAUMA AND CRITICAL CARE
A QUESTION OF BALANCE: FROM BRAIN MONITORING TO SPINE SURGERY
Moderator(s): Eve C. Tsai
Speakers: Paul M. Arnold, Michael G. Fehlings, Jamshid Ghajar, Guy Rosenthal, Menashe Zaaroor
Learning Objectives: Upon completion of this course, participants should be able to:

■ Describe the latest developments with respect to IMPACT: International Mission for Prognosis and Analysis of Clinical Trials in traumatic brain injury.
Discuss the practice of Neurotrauma in the battlefield.
Discuss the benefits and limitations of Neuromonitoring in the utility of ICP monitoring.
Describe the benefits and limitations regarding early decompression for central cord injury.

7:00 – 7:05 AM
Introduction of Marmarou Lecturer

7:05 – 7:35 AM
Marmarou Lecture

7:35 – 7:40 AM
Questions

7:40 – 8:00 AM
Controversy: Neurotrauma in Battlefield; Traumatic Brain Injury and Intracranial Pressure Monitoring – A Question of Balance

7:40 – 7:50 AM
Neurotrauma in Battlefield
Menashe Zaaroor

7:50 – 8:00 AM
Neuromonitoring in the Utility of ICP Monitoring
Guy Rosenthal

8:00 – 8:05 AM
Questions

8:05 – 8:25 AM
Controversy: Early Decompression for Central Cord Injury – A Question of Balance?

8:05 – 8:15 AM
For: Michael G. Fehlings

8:15 – 8:25 AM
Against: Paul M. Arnold

8:25 – 8:30 AM
Balance – Questions
to current day understanding/interpretation of the law.

- Analyze the possible future direction of the ACA and its impact on neurosurgical practice patterns.
- Assess the financial impact of the Affordable Care Act on neurosurgical practice.

**SECTION ON CEREBROVASCULAR**

**CONTROVERSIES IN CEREBROVASCULAR NEUROSURGERY: A QUESTION OF BALANCE**

**Moderator(s):** Adam S. Arthur, Peter Nakaji
**Faculty:** Felipe Albuquerque, Ralph G. Dacey, Carlos A. David, Robert E. Harbaugh, Brian Lim Hoh, Michael Kerin Morgan, Andrew J. Ringer, Babu Guai Welch, John Allen Wilson

**Learning Objectives:** Upon the completing of the meeting the attendees will be able to:

- Discuss the current controversies in the treatment of small unruptured aneurysms.
- Discuss the current controversies in the treatment of brain AVMs.
- Discuss the current controversies in the treatment of carotid disease.

**Controversies in Aneurysm Treatment: The Small Unruptured Anterior Circulation Aneurysm**

**Finding Balance in Aneurysm Treatment**

- **7:00 – 7:10 AM**  
  **Argument for a Coil First Strategy**  
  Andrew J. Ringer

- **7:10 – 7:20 AM**  
  **Argument for a Clip First Strategy**  
  Carlos A. David

- **7:20 – 7:30 AM**  
  **Finding Balance in Brain AVM Treatment**

**Finding Balance in Stroke Treatment: Stent vs. Endarterectomy for the Older Patient**

- **7:40 – 7:50 AM**  
  **The Case for Stenting Felipe Albuquerque

**7:50 – 8:00 AM**  
**The Case for Endarterectomy Robert E. Harbaugh**

**8:00 – 8:05 AM**  
**Introduction of Drake Lecturer Brian Lim Hoh**

**8:05 – 8:30 AM**  
**Drake Lecturer Ralph G. Dacey**

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**MONDAY, OCTOBER 20**

- **7:30 – 7:45 AM**  
  **The Case for Embolization + Radiosurgery: Is This a Viable Strategy? Babu Guai Welch**

- **7:30 – 7:40 AM**  
  **Surgery without Embolization for AVM Michael Kerin Morgan**

**Finding Balance in Stroke Treatment: Stent vs. Endarterectomy for the Older Patient**

- **7:40 – 7:50 AM**  
  **The Case for Stenting Felipe Albuquerque**

- **7:50 – 8:00 AM**  
  **The Case for Endarterectomy Robert E. Harbaugh**

**8:00 – 8:05 AM**  
**Introduction of Drake Lecturer Brian Lim Hoh**

**8:05 – 8:30 AM**  
**Drake Lecturer Ralph G. Dacey**

**WOMEN IN NEUROSURGERY**

**NAVIGATING A NEUROSURGICAL CAREER: ALWAYS A QUESTION OF BALANCE**

**Moderator(s):** Aruna Ganju, Uzma Samadani
**Speakers:** Deborah L. Benzil, Fernando G. Diaz, Karin M. Muraszko, Julie G. Pilitsis, James T. Rutka

**Learning Objectives:** Upon completion of this session the attendee will be able to:

- Discuss strategies for negotiating the landscape of private and academic neurosurgical positions.
- Discuss strategies for conflict resolution.
- Describe techniques for advancement of one’s neurosurgical career.

**8:30 AM – 4:30 PM EXHIBITS**

<table>
<thead>
<tr>
<th>8:30 – 9:00 AM</th>
<th>COFFEE BREAK in the Exhibit Hall</th>
</tr>
</thead>
</table>

Stay connected at http://m.cns.org 41
Presiding Officer: Nathan R. Selden
Moderator(s): Steven N. Kalkanis, Ganesh Rao
Learning Objectives: Upon completion of this course, participants will be able to:
- Describe how changes in health care economics will affect the practice of neurosurgery.
- Explain the advantages and disadvantages of aggressive versus conservative treatment of skull base meningiomas.
- Explain the advantages and disadvantages of open surgery versus pipeline/flow diversion for vascular conditions.
- Explain the advantages and disadvantages of surgery versus conservative care of cervical myelopathy.

9:00–9:03 AM
Introduction and Disclosures
Nathan R. Selden

9:03–9:23 AM
TUMOR – Skull Base Meningioma
Aggressive vs. Conservative
Douglas Kondziolka, Laligam N. Shekar

9:23–9:43 AM
VASCULAR – Open Surgery vs. Pipeline/Flow Diversion
Elad I. Levy, Jacques J. Morcos

9:43–10:03 AM
SPINE – Surgery vs. Conservative Care for Cervical Myelopathy
Zoher Ghogawala, James S. Harrop

10:03–10:05 AM
Introduction of CNS Resident Award Winner
Krystal L. Tomei

10:05–10:17 AM
CNS Resident Award
Julio C. Farfan

10:17–10:20
Introduction of CNS President
Robert J. Dempsey

10:20–10:45 AM
Presidential Address
Daniel K. Resnick

10:45–10:48 AM
Introduction of Honored Guest
Gregory R. Trost

10:48–11:08 AM
HONORED GUEST LECTURE
Edward C. Benzel

11:08–11:10 AM
Introduction of Featured Speaker
Adnan Hussain Siddiqui

11:10–11:30 AM
FEATURED SPEAKER
Michael Ensley

11:45 AM–12:15 PM
Live Surgery in the Exhibit Hall
Expanded Endonasal Endoscopy
CME is not offered for this session.
Operating: Paul A. Gardner
Moderator(s): James K. Liu, Jacques J. Morcos

12:30–2:00 PM
Luncheon Seminars
MO1–MO9
(See Page 28 for Full Listing)
All Luncheon Seminars include a plated lunch served in the seminar room.
Luncheon Seminar fees are $95 each ($75 for Residents/Fellows/Medical Students/Advance Practice Providers).

2:00–3:30 PM
Hot Topics I
The Management of Concussion in Children and Young Adults
PEDIATRICS
Moderator(s): Jeffrey P. Greenfield, Thomas G. Luerssen
Faculty: Richard G. Ellenbogen, Hugh Garton, Mark R. Proctor
Learning Objectives: Upon completion of this course, participants will be able to:
- Explain the important clinical considerations in initial concussion assessment and return to play criteria for pediatric patients.
- Discuss existing public health efforts in education and advocacy with emphasis on opportunities for neurosurgeons to engage the lay conversation on concussion in sports.

2:00–2:15
Introduction
Jeffrey P. Greenfield, Thomas G. Luerssen

2:15–2:40 PM
Education and Advocacy
Richard G. Ellenbogen

2:40–3:05 PM
Return to Play Criteria
Mark R. Proctor

3:05–3:30 PM
The Basic Science of Concussion
Hugh Garton
Hot Topic 2
The Balance Due: Payment for Neurosurgeons
Practical Guide to the Current Health Delivery System
Moderator(s): John Allen Wilson
Speakers: Joseph S. Cheng, Steven A. Toms, Clarence B. Watridge
Learning Objectives: Upon completion of this course, participants will be able to:
■ Gain familiarity with changes in reimbursement under the Affordable Care Act (ACA).
■ Improve practice management to insure stable, appropriate remuneration for provided services under changing compliance guidelines.

2:00 – 2:30 PM
New Reimbursement Models for Neurosurgeons in the Era of the Affordable Care Act
Steven A. Toms

2:30 – 3:00 PM
Update on the RUC and Coming Revaluation of Neurosurgical Codes
Joseph S. Cheng

3:00 – 3:30 PM
Reimbursement vs. Payment: Are We Ambivalent About Being Paid for Our Work?
Clarence B. Watridge

4:15 – 5:30 PM
INTERNATIONAL FORUM
Moderator(s): Feridun Acar, Zeev Feldman, Koji Ihara, Shekar Kurpad, Charles Y. Liu, Mika Risto Niemela, Vadantam Rajeshkhar
Learning Objectives: Upon completion of this course, participants will be able to:
■ Discuss the findings of neurosurgical studies from around the World.
■ Critique the design and methodology of these studies.
■ List important areas for further knowledge development and research.

3-D Neurosurgery: Techniques to Advance Safety and Efficacy in Micro-neurosurgery
Moderator(s): Mustafa Kemal Baskaya, Aaron A. Cohen-Gadol
Course Description: This course will review the important technical and anatomic nuances for the successful management of complex cranial cases. Information will be delivered through 3-D high definition surgical videos and step-by-step discussion by experts in the field. Topics to be reviewed include surgical techniques and anatomy for both cranial and spinal vascular and neoplastic lesions.
Learning Objectives: Upon completion of this course, participants will be able to:
■ Discuss the management of complex cranial cases.
■ Discuss the management of complex spinal cases.
■ Discuss relevant anatomy of complex cranial cases.
■ Discuss relevant anatomy of complex spinal cases.
■ Incorporate new techniques and management strategies into surgical practice.

Stay connected at http://m.cns.org
PROGRAM HIGHLIGHTS
TUESDAY, OCTOBER 21

12:30 – 2:00 PM
RESIDENT SANS CHALLENGE CHAMPIONSHIP ROUND

4:15 – 5:30 PM
NEUROSURGICAL FORUM

5:30 – 6:30 PM
RESIDENT RECRUITMENT SOCIAL
Residents have the opportunity to make connections with recruiters and practicing physicians who are looking to add to their practice.
7:00 – 8:30 AM

**SECTION SESSIONS**

**ORAL PRESENTATIONS**

Learning Objectives: Upon completion of this course, participants will be able to:

- 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.

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**SECTION ON CEREBROVASCULAR**

**Moderator(s): Ketan R. Bulsara, Louis J. Kim**

7:00 – 7:09 AM

124 Minimally Invasive Transpalpebral “Eyelid” Craniotomy for Anterior Circulations Aneurysms: 71 Cases Experience

Khaled M. Aziz, Kenan Alkhalili, Mohab M. Darwish, Gasser Alshyal

7:09 – 7:18 AM

125 Safety and Efficacy of the Pipeline Embolization Device in 100 Small Intracranial Aneurysms: 71 Cases Experience

Khaled M. Aziz, Kenan Alkhalili, Mohab M. Darwish, Gasser Alshyal

7:18 – 7:27 AM

126 Cost Utility of Serial CTA versus MRA for Small, Unruptured, ICA Aneurysms: Are Either Worth It?

Matthew Fusco, Ajith J. Thomas, Saresh A. Reddy, Christopher S. Ogilvy

7:27 – 7:36 AM

127 Carotid Revascularization for Stenosis Improves Blood Flow and Executive Cognitive Function

Zoher Ghogawala, Jill Curran, Henry H. Woo, Brian Lim Hoh, Michael Westerveld, Sepideh Amin-Hanjani

7:36 – 7:45 AM

128 Long-term Outcomes After Intraventricular Thrombolysis and Endovascular Therapy for High-Grade Aneurysmal Subarachnoid Hemorrhage

John H. Wong, Alim P. Mitha, Andreas H. Kramer

7:45 – 7:54 AM

129 A Multicenter International Study of Surgical Clipping for Unruptured Very Small Intracranial Aneurysms

Michael Bruneau, Sepideh Amin-Hanjani, Paivi Koroknay-Pal, Philippe Bijlenga, Behnam Reza Aljahromi, Hanna Lehto, Riku Sivisalaa, Karl Schaller, Fady T. Charbel, Sajeeb Kahn, Christian Melot, Mika Risto Niemelä, Juhana Antero Hernesniemi

7:54 – 8:03 AM

130 Prospective Randomized Study Comparing Clinical, Functional and Aesthetics Results of Classical Pterional and Minipterional Craniotomies

Leonardo Welling, Eberalving Filgueira, Hung T. Wen, Marcos Q. Gomes, Edson Bor-Seng-Shu, Wellinson S. Paiva, Cesar Casaroli, Vinicius P. Guirado, Manoel Jacobsen Teixeira

8:03 – 8:12 AM

131 Arteriovenous Malformations of the Posterior Circulation

Wayang Yang, Hanxing Shang, Justin M. Caplan, Joanna Wang, Maria Breil, Alice Hung, Varun Patel, Geoffrey P. Colby, Alexander Lewis Coon, Rafael J. Tamargo, Judy Huang

8:12 – 8:21 AM

**SYNTHES CEREBROVASCULAR AWARD**

132 Treatment of Ruptured Anterior Communicating Artery Aneurysms: Equipoise in the Endovascular Era

Karam Moon, Peter Nakaji, Felipe Albuquerque, Joseph M. Zabramski, Cameron G. McDougall, Robert F. Spetzler

8:21 – 8:30 AM

**GALBRAITH AWARD**

133 Bilateral Failure of Cerebral Autoregulation is Related to Unfavourable Outcome After Subarachnoid Hemorrhage

Karol P. Budohoski, Peter J. Kirkpatrick, Peter Smielewski, Matthias Reinhard, Georgios V. Varsos, Magdalena Kasprowicz, Miroslaw Zabek, John Douglas Pickard, Marek Czosnyka

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**COUNCIL OF STATE NEUROSURGICAL SOCIETIES**

**Moderator(s): Darlene Angela Lobel, Clemens M. Schirmer**

7:00 – 7:09 AM

134 Inter-hospital Transfer of Neurosurgical Patients to a High Volume Tertiary Care Center: Comprehensive Analysis and Opportunities for Process Improvement

Christopher Michael Holland, Evan W. McClure, Brian M. Howard, Owen B. Samuels, Daniel L. Barrow

7:09 – 7:18 AM

**JULIUS GOODMAN RESIDENT AWARD**

135 A Conservative Policy of Intraoperative Neuromonitoring for Spinal Surgery: Costs and Outcomes

Shane Hawksworth, Nicholas Andrade, Colin Son, Viktor Bartanusz, David F. Jimenez

7:18 – 7:27 AM

136 Preoperative Predictors of 3 Month and 1 Year Change in Quality of Life (EQ-5D) Following Multilevel Lumbar Laminectomy and Fusion

Stephen Kyle Mendenhall, Jesse E. Bible, Patrick David Kelly, Priya Sivasubramaniam, David Shau, Matthew J. McGirt, Clinton J. Devin

7:27 – 7:36 AM

137 Risk Modeling Predicts Complication Rates for Spinal Surgery

Kristopher T. Kimmell, G. Edward Vates, Babak S. Jahromi

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**TUESDAY, OCTOBER 21**

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Stay connected at http://m.cns.org
SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES

Moderator(s): Patrick C. Hsieh, Justin S. Smith

7:00 – 7:09 AM
144 Predicting Recovery After a Spinal Cord Injury: The Role of Diffusion Basis Spectrum Imaging (DBSI) as a Biomarker of Corticospinal Tract Integrity
Rory K.J. Murphy, Paul Gamble, Peng Sun, Yong Wang, Eileen Jacobs, Sheng-Kwei Song, Wilson Zachary Ray

7:09 – 7:18 AM
145 Evaluating Initial Spine Trauma Response: Injury Time to Trauma Center
James S. Harrop, George M. Ghobrial, Rohan Chitale, Kelly Krespan, Laura Odorizzi, Tristan Fried, Mitchell Gil Maltonfort, Murray Cohen, Alexander R. Vaccaro

7:18 – 7:27 AM
146 Diffusion Tensor Imaging Metrics Correlate with Quantitative Tests of Physical Function in Cervical Spondylotic Myelopathy
Marjorie C. Wang, Aditya Vedantam, Brian Schmit, Shekar N. Kurpad

7:27 – 7:36 AM
147 Risk of Development of New Onset Post Operative Cervical Deformity (CD) in Thoracolumbar Adult Spinal Deformity (ASD) and Effect on Clinical Outcomes at 2 year Follow Up
Alex Soroceanu, Peter G. Passias, Anthony Boniello, Justin K. Scheer, Frank Schwab, Christopher I. Shaffrey, Han Jo Kim, Themistocles Protopsaltis, Gregory Mundis, Munish Gupta, Eric Klineberg, Virginie Lafage, Justin S. Smith, Christopher P. Ames

7:36 – 7:45 AM
148 Smoking Effects on Perioperative Outcomes and Fusion Rates Following Anterior Cervical Corpectomy and Fusion: Does Quitting Really Help?
Darryl Lau; Dean Chou, John E. Ziewacz, Praveen V. Mummaneni
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>8:12 – 8:21 AM</td>
<td>152 Rate of Symptomatic Adjacent Segment Disease after MIS vs. Open Transforaminal Lumbar Interbody Fusion</td>
<td>Scott L. Parker, Tim E. Adamson, Matthew J. McGirt, Vinay R. Deshmukh</td>
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<td>8:21 – 8:30 AM</td>
<td>153 Surgical Outcome of Single-portal Endoscopic Carpal Tunnel Release Using a Forward-facing Knife in 1,000 Consecutive Hands</td>
<td>Hyung Sik Hwang, Se-Hyuck Park</td>
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**SECTION ON NEUROTRAUMA AND CRITICAL CARE**

**Moderator(s):** Patricia B. Raksin, Shelly D. Timmons

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tr>
<td>7:00 – 7:09 AM</td>
<td>DEPUY/SYNTHES AWARD FOR RESIDENT RESEARCH RESEARCH ON SPINAL CORD AND SPINAL COLUMN INJURY</td>
<td>Julo C. Farlan, Yang Liu, Dalton Dietrich, Michael Norenberg, Sydney Croul, Michael G. Fehlings</td>
</tr>
<tr>
<td>7:27 – 7:36 AM</td>
<td>157 The Effectiveness of CT Angiography on Cervical Spine Fracture Outcomes</td>
<td>Megan Lockwood, Andreea Seicean, Joseph Tanenbaum, Daniel Lubeski, Edward C. Benzel, Thomas E. Mroz, Michael P. Steinmetz</td>
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<tr>
<td>7:36 – 7:45 AM</td>
<td>158 Cognitive, Functional and Psychosocial Outcome After Severe Traumatic Brain Injury: A Cross Sectional Study at a Tertiary Care Trauma Center</td>
<td>Sumit Sinha, Ashima Nehra, Bhawani S. Sharma</td>
</tr>
<tr>
<td>7:45 – 7:54 AM</td>
<td>159 Antiplatelet Therapy after Traumatic Intracranial Hemorrhage</td>
<td>Keith A. Kerr, Chris Wilkerson, Scott R. Shepard, Alex Choi, Ryan Seiji Kitagawa</td>
</tr>
<tr>
<td>7:54 – 8:03 AM</td>
<td>160 A Decade of ICP-Guided Treatment of Severe Head Injury: An Analysis of Exposure to Raised ICP and Effect on Outcome</td>
<td>Ji Min Ling, Tee Phee Kee, Kah Keow Lee, Serene LH Tan, Nicolas KK King</td>
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<tr>
<td>8:03 – 8:12 AM</td>
<td>161 Complications and Duration of Vasopressor Usage for Acute Traumatic Central Cord Syndrome</td>
<td>Sanjay S. Dhall, Geoffrey T. Manley, Tomoo S. Inoue, William Whetstone</td>
</tr>
<tr>
<td>8:12 – 8:21 AM</td>
<td>162 Higher Mean Arterial Blood Pressures Following Spinal Cord Injury are Associated With Greater Neurological Recovery</td>
<td>Gregory W.J. Hawryluk, William Whetstone, Rajiv Saigal, Adam Ferguson, Jason Talbott, Jacqueline Bresnahan, Jonathan Pan, Michael Beattie, Sanjay S. Dhall, Geoffrey T. Manley</td>
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<tr>
<td>8:21 – 8:30 AM</td>
<td>163 Brain Tissue Oxygenation and 3 and 6-month Neurological Outcome in Severe Traumatic Brain Injury</td>
<td>David Michael Panczykowski, Ava Puccio, Yue-Fang Chang, Lori Anne Shutter, David O. Okonkwo</td>
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**SECTION ON PAIN**

**Moderator(s):** Erika A. Petersen, Jason M. Schwalb

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<th>Time</th>
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<td>7:00 – 7:09 AM</td>
<td>Degree of Nerve Atrophy on Preoperative Imaging Predicts Outcome after Microvascular Decompression for Trigeminal Neuralgia</td>
<td>Jonathan Miller, Yifei Duan, Jennifer A. Sweet</td>
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<tr>
<td>7:36 – 7:45 AM</td>
<td>167 The Effectiveness of Surgery For Trigeminal Neuralgia in Surgical Naïve Patients, A Retrospective Study</td>
<td>Marshall Thomas Holland, Jennifer Noller, John M. Buatti, Wenzhuan He, Patrick W. Hitchon</td>
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| 7:36 – 7:45 AM | **Randomized Control Study of Percutaneous Epidural Neuroplasty and Translaminar Epidural Steroid Injection in Cervical Disc Disease with 6 Months of Follow-up**  
Chang Hyun Oh, Gyu Yeul Ji, Seung Hyun Choi, Hyun Goo Kim, Young Sul Yoon, Dong Ah Shin |
| 7:45 – 7:54 AM | **Microvascular Decompression for Hemifacial Spasm: Analysis of Surgical Failures and Repeat Surgery**  
Mark G. Bigder, Anthony M. Kaufmann |
| 7:54 – 8:03 AM | **Do Advanced Programming Options Make a Difference in Spinal Cord Stimulation?**  
Steven G. Roth, Jessica Haller, Meghan Heran, Steven Lange, Joannalee C. Campbell, Priscilla De La Cruz, Julie G. Pilitsis |
| 8:03 – 8:12 AM | **An Investigation of the Effects of Subthalamic Deep Brain Stimulation on Thermal and Mechanical Thresholds in Parkinsonian Rats**  
Lucy Gee, Joannalee C. Campbell, Damian Shin, Julie G. Pilitsis |
| 8:12 – 8:21 AM | **Two Stage Procedure of Spinal Cord Stimulator for Neuropathic Pain**  
Muhammad Jalaluddin |
| 8:21 – 8:30 AM | **Peri-Operative IV Acetaminophen in Lumbar Spinal Surgery - Initial Results**  
James Leonard West, Nicole A. Colwell, Sergio M. Gonzalez-Arias |
| 7:00 – 7:09 AM | **Epilepsy Surgery in Infants Under a Year of Age**  
Ramesh Mohan Kumar, Brent R. O’Neill, Susan Koh, Pramote Laoprasert, Kelly Knupp, Kristin Park, Kevin Chapman, Michael H. Handler |
| 7:09 – 7:18 AM | **Treatment Outcomes and Prognostic Factors of Pediatric Glioblastoma Multiforme**  
Terence Verla, Ranjith Babu, Vijay Agarwal, Kyle Gregory Halvorson, D. Cory Adamson |
| 7:18 – 7:27 AM | **Microbubble Assisted Ultrasound Guidance for Assessing the Adequacy of Endoscopic Membrane Fenestration in Multiloculated Hydrocephalus in Children**  
Lweellyn Padayachy, Graham A. G. Fieggen |
| 7:27 – 7:36 AM | **New Designs of Ventricular Catheters for Hydrocephalus by 3-D Computational Fluid Dynamics**  
Marcelo Galarza, Angel Gimenez, Olga Pellicer, Juan Valero, Jose M. Amigo |
| 7:36 – 7:45 AM | **A Comparison of Prophylactic and Symptomatic Detethering of Patients with Lumbosacral Lipomas in a Modern Era**  
Albert Tu, Ross Hengel, Douglas Cochrane |
| 7:45 – 7:54 AM | **Assessing Health-Related Quality of Life in Adults with Spina Bifida**  
Brandon George Rocque, Ralee’ Bishop, Mallory Scogin, Betsy D. Hopson, Anastasia A. Arynchyna, Christina J. Boddiford, Chevis N. Shannon, Jeffrey P. Blount |
| 7:54 – 8:03 AM | **Impacts that Cause Transiently Symptomatic mTBI Can Also Cause Intracranial Tissue Schisis in a Juvenile Rodent Model**  
David M. Frim, David W. Wright, Julian E. Bailes |
| 8:03 – 8:12 AM | **Incidence of Cervical Spine Injury Among Pediatric Victims of Non-Accidental Trauma.**  
Monica L. Melgar, Jonathan Rassan, Amy P. Bansal, Mark D. Krieger |
| 8:12 – 8:21 AM | **Pediatric Craniotomies: Incidence, Predictors, and Costs for a Tri-State Analysis with 1-Year Readmission Follow-Up**  
Bryan Iorgulescu, Mark M. Souweidane, Jeffrey P. Greenfield, Andrew T. Parsa |
| 8:21 – 8:30 AM | **Intracranial Arachnoid Cysts and Hemorrhage**  
Hoon Choi, Joseph R. Madsen, R. Michael Scott, Benjamin C. Warf, Alan R. Cohen, Mark R. Proctor, Emma Huebenthal, Sarah C. Jernigan, Liliana Goumnerova |
| 7:00 – 7:09 AM | **Minimally Invasive Transpalpebral Endoscopic Assisted Amygdalohippocampectomy**  
Mauricio Mandel, Eberval G. Figueiredo, Manoel Jacobsen Teixeira |
| 7:09 – 7:18 AM | **3-T MRI Track Density Imaging to Identify Thalamic Nuclei for Functional Neurosurgery**  
Timothy M. Shepherd, Sohae Chung, Christopher Gielmi, Alon Y. Mogilner, Fernando Boada, Douglas Kondziolka |
TUESDAY, OCTOBER 21

7:18 – 7:27 AM  
**186** Spinal Cord Stimulation and Functional MRI: Pain Relief Correlates with Decreased Connectivity Between Somatosensory and Limbic Brain Networks  
Milind Deogaonkar, Chima Oluigbo, Dylan Nielson, Xiangyu Yang, Mayur Sharma, Louis Vera-Portocarrero, Greg Molnar, Amir Abduljalil, Per Sederberg, Ali R. Rezaei

7:27 – 7:36 AM  
**187** Memory Loss After Brain Injury Is Improved by Theta Burst Stimulation of the Fornix  
Jonathan Miller, Charles Nelson Munyon, Philip Fastenau, Christopher Bailey, Jennifer A. Sweet

7:36 – 7:45 AM  
**188** Decoding the Inferior Temporal Cortex at the Speed of Perception  
Kai Miller, Gerwin Schalk, Dora Hermes, Jeffrey G. Ojemann, Rajesh Rao

7:45 – 7:54 AM  
**189** The Physiology of Heteromodal Proper Naming in the Human Anterior Temporal Lobe  
Taylor J. Abel, Ariane Rhone, Kirill Nourski, Hiroto Kawasaki, Hiroyuki Oya, Hiroyuki Oya, Colin Buzza, Mark A. Granner, Michael J. Welsh, Matthew A. Howard, Daniel Tranel

7:54 – 8:03 AM  
**190** Mechanism for Sudden Unexpected Death in Epilepsy (SUDEP): The Amygdala as a Pathway to Seizure-induced Apnea, Respiratory Agnosia and Sudden Death  
Brian J. Dlouhy, Brian K. Gehlbach, Collin J. Kreple, Hiroto Kawasaki, Hiroyuki Oya, Colin Buzza, Mark A. Granner, Michael J. Welsh, Matthew A. Howard, John A. Wemmie, George B. Richerson

8:03 – 8:12 AM  
**191** Methodology for Critical Evaluation of Laser Placement in Stereotactic Laser Ablation for Mesial Temporal Lobe Epilepsy: A Pilot Study  
Chengyuan Wu, Richard Gorniak, Meela Mehdi, Michael Sperling, Ashwini Dayal Sharan

8:12 – 8:21 AM  
**192** Stereotactic Striatal Injection of a Regulated GDNF Expression System: Preclinical Testing in a Primate Model  
Seth Franklin Oliveria, Kelly D. Foote, Ronald Mandel

8:21 – 8:30 AM  
**193** The Human Neocortex Demonstrates Projectors and Receivers of Influence: A Consideration in Neuromodulation Therapy  
Laszlo Entz, Emilia Toth, Corey J. Keller, David Groppe, Pierre Megevand, Daniel Fabo, Istvan Ulbert, Lorand G. Eross, Ashesh Mehta

8:30 – 8:40 AM  
**194** Assessment of Treatment Response in IDH-mutant Gliomas by Quantification of 2-Hydroxyglutarate with in-vivo 3D Magnetic Resonance Spectroscopy  
Franziska Loebel, Daniel P. Cahill, Wolfgang Bogner, Malgorzata Marjanska, Elizabeth Gerstner, Tracy Batchelor, Bruce R. Rosen, Andrew S. Chi, Ovidiu C. Andronesi

8:40 – 8:50 AM  
**195** Urinary Biomarkers Identify Pediatric Brain Tumors Non-invasively and Correlate with Prognostic Risk Factors  
Xuezhe Han, Katie Pricola, Rajarshi Majumder, Micah Duggins-Warf, Michael Robert Raber, Edward R. Smith

8:50 – 9:00 AM  
**196** IDH-1 Mutated Glioblastomas Have a Less Invasive Phenotype Than IDH-1 Wild Type Glioblastomas: A Diffusion Tensor Imaging Study  
Stephen J. Price, Natalie R. Boonzaier, Victoria Lapson, Timothy Larkin

9:00 – 9:09 AM  
**197** Confocal Laser Endomicroscopy for Real Time Histomorphological Diagnosis: Our Clinical Experience with 150 Brain and Spinal Tumor Cases.  
Cleopatra Charalampaki

9:09 – 9:18 AM  
**198** Circulating Tumor Cells in Patients with Glioblastoma  
Brian V. Nahed, James P. Sullivan, Marissa W. Madden, Samantha M. Oliveira, Andrew S. Chi, Simeon Springer, Hiro Wakimoto, Deepak Bhere, Ajay Shah, Phil Spuhler, Tracy Batchelor, David N. Louis, Mehmet Toner, Shyamala Maheswaran, Daniel A. Haber

7:09 – 7:18 AM  
**COLUMBIA SOFTBALL CHARITY AWARD**

7:18 – 7:27 AM  
**Brainlab Neurosurgery Award**

7:27 – 7:36 AM  
**National Brain Tumor Society Mahaney Clinical Research Award**

7:36 – 7:45 AM  
**American Brain Tumor Association Young Investigator Award**

7:45 – 8:03 AM  
**Sherry Apple Resident Travel Scholarship**

8:03 – 8:12 AM  
**American Brain Tumor Association Young Investigator Award**

7:00 – 7:09 AM  
**Columbia Softball Charity Award**

7:18 – 7:27 AM  
**Brainlab Neurosurgery Award**

7:27 – 7:36 AM  
**National Brain Tumor Society Mahaney Clinical Research Award**

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**American Brain Tumor Association Young Investigator Award**

7:45 – 8:03 AM  
**Sherry Apple Resident Travel Scholarship**

8:03 – 8:12 AM  
**American Brain Tumor Association Young Investigator Award**

TUESDAY, OCT 21

Stay connected at http://m.cns.org

Stay connected at http://m.cns.org 49
Presiding Officer: Alan M. Scarrow
Moderator(s): Bernard R. Bendok
Learning Objectives: Upon completion of this session, participants will be able to:
- Describe strategies to achieve compliance with the Accountable Care Act.
- Discuss neurosurgical management of aneurysm remnants.
- Recognize the implications of important neurosurgical research.

9:00–9:02 AM
Introduction of CNS International Division
Charles Liu

9:02–9:14 AM
Obamacare – What It Means for You
Fernando G. Diaz

9:14–9:38 AM
Aneurysm Remnants
Michael T. Lawton, Erol Veznedaroglu

9:38–9:41 AM
Introduction of Distinguished Service Award
Ali R. Rezi
Award Winner
Jamie S. Ullman

9:41–9:44 AM
Introduction of Founder’s Laurel Award
Ali R. Rezi
Award Winner
Michael L.J. Apuzzo

9:44–9:47 AM
Introduction of Japanese Presidential Address
Koji Iihara

9:47–9:57 AM
Japanese Presidential Address
Koji Iihara

9:57–10:00 AM
Introduction of Christopher C. Getch Fellowship Winner
Aviva Abosch

10:00–10:12 AM
Christopher C. Getch Fellowship
Kristopher T. Kahle

10:12–10:24 AM
Convergence of Stereotactic Surgery and Epilepsy: sEEG
Jorge Gonzalez Martinez

10:24–10:49 AM
HONORED GUEST LECTURE
Edward C. Benzel

10:49–11:01 AM
Neurosurgeons as Healers
Anil Nanda

11:01–11:04 AM
Introduction of Michael L. J. Apuzzo Lecture on Creativity and Innovation
Arun Amar, Daniel K. Resnick

11:04–11:30 AM
MICHAEL L.J. APUZZO LECTURE ON CREATIVITY AND INNOVATION
Philip Glass
11:45 AM–12:15 PM
Live Surgery in the Exhibit Hall
Sylvian Fissure Dissection
CME not offered for this session.
Operating: Robert F. Spetzler
Moderator(s): Fady T. Charbel, Michael T. Lawton, Fredric B. Meyer,

12:30 – 2:00 PM
Luncheon Seminars
T10 – T18
(See Pages 29-30 for Full Listing)
All Luncheon Seminars include a plated lunch served in the seminar room.
Luncheon Seminar fees are $95 each ($75 for Residents/Fellows/Medical Students/Advance Practice Providers).

12:30 – 2:00 PM
RESIDENT SANS CHALLENGE CHAMPIONSHIP ROUND
Come and enjoy the crème de la crème at the SANS Challenge Championship Round! Don’t miss this fun and engaging competition as residents go head-to-head and test their knowledge. Audience participation is encouraged!

2:00 – 3:30 PM
HOT TOPICS
Hot Topic 3
Balancing Quality and Cost in the Era of the Affordable Care Act
Moderator(s): Anthony L. Asher
Speakers: William A. Friedman, Zohar Ghogawala, Rachel Groman, Alexander A. Khalessi
Learning Objectives: Upon completion of this course, participants will be able to:
- Define Physician Quality Reporting Systems (PQRS) under the Affordable Care Act.
- Recognize provider participation in PQRS will carry repercussions for reimbursement.
- Discuss efforts by the federal government and third party payers to define neurosurgical quality.
- Describe organized neurosurgery’s efforts to catalogue neurosurgical outcomes through N2QOD.
- Explain reimbursement implications for PQRS participation in private and academic practice settings.
- Undertake the initial steps for incorporating PQRS into their practice and insuring stable remuneration for services provided.

2:00 – 2:22 PM
Defining Quality in Neurosurgery: How Will Our Efforts Be Measured?
William A. Friedman

2:22–2:44 PM
N2QOD: Defining Quality for Ourselves
Zohar Ghogawala

2:44–3:07 PM
ACAA: Implications for Private Practice Neurosurgeons
Anthony L. Asher

3:07–3:30 PM
ACAA: Implications for Academic Neurosurgeons
Alexander A. Khalessi

Hot Topic 4
The Management of Chiari Type 1 Malformation
Moderator(s): Mark D. Krieger
Faculty: Douglas L. Brockmeyer, Cormac O. Maher, W. J. Oakes
Learning Objectives: Upon completion of this course, participants will be able to:
- Describe the clinical and radiographic criteria for Chiari I malformation.
- Explain the downstream clinical consequences of progressive symptomatology including syrinx development.
- Review competing surgical alternatives for Chiari decompression with or without duroplasty.
- Discuss factors impacting surgical timing and surveillance imaging strategy for patients managed conservatively.

2:00 – 3:30 PM
Controversies
Degenerative Scoliosis
Moderator(s): Christopher I. Shaffrey
Speakers: Charles Kuntz, Juan S. Uribe

Short
Juan S. Uribe

Long
Charles Kuntz

TL Burst
Moderator(s): Michael G. Fehlings
Speakers: Charles Fisher, David O. Okonkwo

MIS
David O. Okonkwo

Brace
Charles Fisher

3:30 – 4:15 PM
EXHIBIT HALL BREAK

3:30 – 4:30 PM
Annual Business Meeting

4:15 – 5:30 PM
Consensus Session II
Management of Metastatic Tumors of the Spine
Moderator(s): Mark H. Bilsky
Speakers: Ziya L. Gokaslan, John E. O’Toole, Timothy C. Ryken, Jason P. Sheehan
Learning Objectives: Upon completion of this course, participants will be able to:
- Discuss current recommendations in management of metastatic tumors of the spine.
- Describe uses of radiotherapy and surgery for spine metastases.
- Explain the unique role of minimally invasive surgery for spinal metastases.

Surgery for Spinal Metastases
Ziya L. Gokaslan

Indications and Uses of Radiotherapy for Spinal Metastases
Jason P. Sheehan
Integrating New Guidelines for Spinal Metastases into a Community Setting
Timothy C. Ryken

MIS Techniques and Applications
John E. O’Toole

4:15 – 5:30 PM
Neurosurgical Forum
Learning Objectives: Upon completion of this course, participants will be able to:
■ Discuss the findings of novel neurosurgical studies.
■ Describe important areas for further research.
■ Identify the most important ongoing clinical trails.

Section on Cerebrovascular
Moderator(s): Judy Huang, Michelle Janine Smith

Council of State Neurosurgical Societies
Moderator(s): Hooman Azmi, Karin R. Swartz

Section on Disorders of the Spine and Peripheral Nerves
Moderator(s): Charles A. Sansur, Cheerag D. Upadhyaya

Section on Neurotrauma and Critical Care
Moderator(s): Martina Stippler, Fahad Alkherayf

Section on Pain
Moderator(s): Jeffrey E. Arle, Parag G. Patil

Section on Pediatric Neurological Surgery
Moderator(s): Taryn McFadden Bragg, Brent R. O’Neill

Section on Stereotactic and Functional Neurosurgery
Moderator(s): Francisco A. Ponce, Nader Pouratian

Section on Tumors
Moderator(s): John S. Kuo, Andrew T. Parsa

4:15 – 5:30 PM
2-D Neurosurgery: Intraoperative Complications Avoidance and Management
Moderator(s): Mustafa Kemal Baskaya, Aaron A. Cohen-Gadol, Paul A. Gardner
Speakers: Daniel L. Barrow, Ketan R. Balsara, Michael T. Lawton, Jacques J. Morcos, Anil Nanda, Mika Risto Niemela
Course Description: This session will discuss specific strategies for avoidance and management of intraoperative complications. Information will be delivered through operative examples via intraoperative videos and anatomy review with discussion and guidance provided by experts.
Learning Objectives: Upon completion of this course, participants will be able to:
■ Describe specific strategies for avoidance and management of inoperative complications.
■ Discuss anatomic considerations to avoid complications.
■ Incorporate into practice new techniques for management on intraoperative complications.

5:30 – 6:30 PM
RESIDENT RECRUITMENT SOCIAL

6:00 – 8:30 PM
DINNER SEMINARS
DIN05 – DIN06
(See Page 33 for Full Listing)
The CNS: The ONE to Move You Forward

Education

Our exclusive SANS programs, 100+ online and in-person CME opportunities and convenient apps for desktop and handheld devices make us the education source for neurosurgeons around the world. The high caliber of our programs is evidenced by our Premier ACCME designation.

Access

We hosted the first modern day live video surgery. With the largest offering of online training, we continue to share the latest techniques in engaging and accessible ways. To improve patient care internationally, we provide free online courses to surgeons in low-income countries. We are investing in our member experience with a website optimized for mobile and desktop use.

Global Network

Scientific exchange for neurosurgical advancement is the core of our mission. Collaboration among members sustains an environment of discovery and innovation. This strong global discourse within our membership is unparalleled.

Advocacy

Fifty percent of every dollar received by the Washington Office for Neurosurgery comes from the CNS. Our support makes sure neurosurgery, quality patient care and our patients’ needs are well represented and defended in the state and federal governments.

Not a CNS member? Register and submit a completed membership application by September 18 to receive a discount on your annual meeting registration fee. Questions? Call 847-240-2500 or email membership@1cns.org. Apply and register now at www.cns.org.

CNS is the ONE for you. Join Today.

Join the CNS

Stay connected at http://m.cns.org
PROGRAM HIGHLIGHTS

WEDNESDAY, OCTOBER 22

LATE BREAKING SCIENCE 7:00 – 8:00 AM

10:45 – 11:15 AM
LIVE SURGERY IN THE EXHIBIT HALL

Fluoroscopic Lateral Approach to the Spine
Operating: Robert G. Whitmore
Moderator(s): Zoher Ghogawala, John Pollina

1:00 – 2:15 PM
HOT TOPICS

Hot Topic 5
Balancing Clinical Research and Individualized Care: The Era of “Personalized Medicine”

Hot Topic 6
Balancing the Future: Neurosurgery in 2025

1:00 – 2:15 PM
CONTROVERSIES

- Management of Unruptured Intracranial Aneurysms
- Aneurysm Size and Location that Prompts Conservative Management versus Surveillance Imaging
- Patient Age as a Factor in Guiding Surgical Versus Endovascular Treatment
- Referable Cranial Neuropathies as a Strong Open Surgical Indication versus Dampered Pulsatility with Endovascular Treatment
- Endovascular Reconstruction versus Clip Sacrifice and Bypass for Fusiform Anterior Circulation Aneurysms
- MCA Aneurysms: Always Clipping versus Stent-Coiling and Intrasacalar Technologies

10:00 AM – 1:00 PM
LAST CHANCE TO VISIT THE EXHIBIT HALL

www.cns.org
GENERAL SCIENTIFIC SESSION IV
8:00–10:30 AM   WEDNESDAY, OCTOBER 22

7:00–8:00 AM
LATE BREAKING SCIENCE
Moderator(s): Nelson Oyesiku
Learning Objectives: Upon completion of this course, participants will be able to:
- Describe the implications of the most up-to-date neurosurgical studies.
- Recognize opportunities for further research or areas of study.

8:00–8:04 AM
Knowledge Gaps and How the CNS Addresses Zoher Ghogawala

8:04–8:19 AM
Functional Neuronal Connectivity in Epilepsy Emad N. Eskandar

8:19–8:34 AM

8:34–8:47 AM
Epilepsy – Temporal Lobectomy or Laser Ablation vs. Medication Management: Why Wait Until Your Brain is Fried? Robert E. Gross

8:47–8:59 AM
Moyamoya in Kids – New Horizon Edward R. Smith

8:59–9:00 AM
Introduction of Israeli President Fredric B. Meyer

9:00–9:15 AM
Israel Neurosurgeon Society President Zeev Feldman

9:15–9:30 AM
Tumor Trials – Are We Better Off Today Than 5 Years Ago? Frederick G. Barker

9:30–9:45 AM
Mayo Clinic: Advances in Repair of Peripheral Nerve Injury Robert J. Spinner

9:45–9:46 AM
Introduction of John Thompson History of Medicine Lecturer Elad I. Levy

9:46–10:01 AM
John Thompson History of Medicine Lecture Janne Sirén

10:01–10:13 AM
NIH Trauma Trial and Advances Geoffrey T. Manley

10:13–10:25 AM
Nanoparticles R. Loch Macdonald

10:25–10:30 AM
AANS President Robert E. Harbaugh

10:30 – 10:33 AM
Announcement of Neurosurgical Forum Winners Steven K. Kalkanis

Stay connected at http://m.cns.org
10:00 AM – 1:00 PM
EXHIBITS

10:45 – 11:15 AM
LIVE SURGERY IN THE EXHIBIT HALL
CME not offered for this session.
Fluoroscopic Lateral Approach to the Spine
Operating: Robert G. Whitmore
Moderator(s): Zoher Ghogawala, John Pollina

11:30 – 1:00 PM
LUNCHEON SEMINARS
W19 – W24
(See Page 30 for Full Listing)
All Luncheon Seminars include a plated lunch served in the seminar room. Luncheon Seminar fees are $95 each ($75 for Residents/Fellows/Medical Students/Advance Practice Providers).

1:00 – 2:15 PM
HOT TOPICS
Hot Topic 5
Balancing Clinical Research and Individualized Care: The Era of “Personalized Medicine”
Speakers: Russell R. Lonser, Elizabeth C. Tyler-Kabera
Learning Objectives: Upon completion of this course, participants will be able to:
- Describe the potential applications of biosensor and immunotherapy across neurosurgical subspecialties.
- Discuss the future direction, risks and benefits of gene therapy in neuro-oncology.
- Explain the application of patient self-reporting and biosensors in spine surgery.
- Review the application of these technologies in tailored neuro-rehabilitation therapies.

Personalized Medicine and Treatment of Tumors (Gene Therapy)
Russell R. Lonser

Personalized Medicine in Spine Surgery

Personalized Recovery
Elizabeth C. Tyler-Kabera

Hot Topic 6
Balancing the Future: Neurosurgery in 2025
Moderator(s): Clark C. Chen
Speakers: Jaimie M. Henderson, Praveen V. Mummaneni, Elad I. Levy, Reid C. Thompson, Menashe Zaaroor
Learning Objectives: Upon completion of this course, participants will be able to:
- Discuss coming improvements in imaging, visualization, technique or devices across neurosurgical subspecialties.
- Identify promising frontiers for research with these technology advancements.
- Describe the criteria for incorporating these potential advancements into practice.

Coming Changes in Spine Surgery
Praveen V. Mummaneni

The Future of Vascular Neurosurgery
Elad I. Levy

The Development of Functional Neurosurgery
Jaimie M. Henderson

The Future of Neurosurgical Oncology
Reid C. Thompson

Focused Ultrasound and its Use in Movement Disorders
Menashe Zaaroor

1:00 – 2:15 PM
Controversies
Management of Unruptured Intracranial Aneurysms
Moderator(s): Alexander A. Khalessi
Speakers: Michael T. Lawton, Adam S. Arthur

Aneurysm Size and Location that Prompts Conservative Management Versus Surveillance Imaging

Patient Age as a Factor in Guiding Surgical Versus Endovascular Treatment

Refractile Cranial Neuropathies as a Strong Open Surgical Indication Versus Dampered Pulsatility with Endovascular Treatment

Endovascular Reconstruction Versus Clip Sacrifice and Bypass for Fusiform Anterior Circulation Aneurysms

MCA Aneurysms: Always Clipping Versus Stent-Coiling and Intracanal Technologies
Congratulations TO ALL THE 2014 AWARD WINNERS!

- **Taylor J. Abel, MD**
  - STEREOTACTIC AND FUNCTIONAL NEUROSURGERY RESIDENT AWARD

- **Lukas Andereggen, MD**
  - SYNTHES SKULL BASE SURGERY AWARD

- **Karol P. Budhoski, MD**
  - GALBRAITH AWARD

- **Cleopatra Charalampaki, MD, PhD**
  - NATIONAL BRAIN TUMOR SOCIETY MAHALEY CLINICAL RESEARCH AWARD

- **Sabih Tariq Effendi, MD**
  - STRYKER NEURO-ONCOLOGY AWARD

- **Julio C. Farlan, MD, MBA, MSc, PhD**
  - DEPUY-SYNTHES AWARD FOR RESIDENT RESEARCH RESEARCH ON SPINAL CORD AND SPINAL COLUMN INJURY

- **Seunggu J. Han, MD**
  - JOURNAL OF NEURO-ONCOLOGY AWARD

- **Xuezhe Han, MD, PhD**
  - COLUMBIA SOFTBALL CHARITY AWARD

- **Shane Hawksworth, MD**
  - JULIUS GOODMAN RESIDENT AWARD

- **Kristopher Thomas Kahle, MD, PhD**
  - RONALD R. TASKER YOUNG INVESTIGATOR AWARD

- **Ricky Raj Singh Kalra, MD**
  - PREUSS AWARD

- **Franziska Loebel**
  - SHERRY APPLE RESIDENT TRAVEL SCHOLARSHIP

- **Matthew J. McGirt, MD**
  - SAMUEL HASSENBUSCH YOUNG NEUROSURGEON AWARD

- **Karam Moon, MD**
  - SYNTHES CEREBROVASCULAR AWARD

- **Brian V. Nahed, MD**
  - AMERICAN BRAIN TUMOR ASSOCIATION YOUNG INVESTIGATOR AWARD

- **Jussi Posti, MD, PhD**
  - DEPUY-SYNTHES AWARD FOR RESIDENT RESEARCH ON BRAIN AND CRANIOFACIAL INJURY

- **Stephan J. Price, BSc, MBBS, FRCS, PhD**
  - BRAINLAB NEUROSURGERY AWARD

- **Derek G. Southwell, MD, PhD**
  - INTEGRA FOUNDATION AWARD

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**CNS COMING ATTRACTIONS**

Look for these riveting, thought-provoking courses from the CNS:

- **NEW! Neurosurgical Oral Board Exam Preparation: Early Review Course**
  - August 8-9, 2014
  - Chicago, Illinois

- **2015 Spine Complications Course**
  - January 25-28, 2015
  - Lake Tahoe, California

- **2015 CNS SANS MOC Board Review Course**
  - March 9-10, 2015
  - Phoenix, Arizona

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**WINS**

Symposium Reception

Tuesday, October 21
6:00 - 8:00 PM

Women Leading The Way Reception

Join us for an evening of networking opportunities, hors d’oeuvres and a Leadership Panel

Stay connected at http://m.cns.org
REGISTRATION INFORMATION

Registration Methods
For your convenience, you can register and reserve your hotel room via these four methods:

**Online:**
www.cns.org

**Phone:**
800.931.9543 US & Canada
972.349.5539 International
8:00 AM – 6:30 PM CT

**Fax:**
972.349.7715

**Mail:**
CNS Registration and Housing Center
6100 West Plano Parkway, Suite 3500
Plano, TX 75093

*Allow five business days for Registration and Housing Confirmation. The CNS Registration and Housing Center is not responsible for faxes not received due to mechanical failure or circumstances beyond our control.

Credit Card Payments
- US dollars and drawn on a US bank
- Visa
- MasterCard
- American Express

Materials Pick-Up
All materials should be picked up on site at the Boston Convention and Exhibition Center.

REGISTRATION RATES

<table>
<thead>
<tr>
<th>Registration Category</th>
<th>ADVANCE REGISTRATION</th>
<th>AFTER SEPTEMBER 18, 2014</th>
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</thead>
<tbody>
<tr>
<td>CNS Active (Domestic &amp; International)</td>
<td>$685</td>
<td>$785</td>
</tr>
<tr>
<td>CNS Transitional Member</td>
<td>$650</td>
<td>$750</td>
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<tr>
<td>CNS International Vista Member</td>
<td>$685</td>
<td>$785</td>
</tr>
<tr>
<td>Non-member Neurosurgean</td>
<td>$920</td>
<td>$1020</td>
</tr>
<tr>
<td>Non-member Physician</td>
<td>$875</td>
<td>$975</td>
</tr>
<tr>
<td>Non-member Non-physician (Clinical Researcher/Scientist)**</td>
<td>$920</td>
<td>$1020</td>
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<tr>
<td>Armed Forces</td>
<td>$475</td>
<td>$575</td>
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<tr>
<td>Resident Member (Domestic &amp; Int'l)*</td>
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<tr>
<td>Resident Non-Member*</td>
<td>$285</td>
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<tr>
<td>Fellow Member (Domestic &amp; Int'l)**</td>
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<td>Fellow Non-member**</td>
<td>$300</td>
<td>$400</td>
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<tr>
<td>Medical Student Member</td>
<td>$0</td>
<td>$0</td>
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<tr>
<td>Nurse Practitioner/Physician Assistant/Nurse/Advanced Practice Provider Non-member</td>
<td>$500</td>
<td>$600</td>
</tr>
<tr>
<td>Affiliate</td>
<td>$300</td>
<td>$400</td>
</tr>
<tr>
<td>Neurosurgeon (Faculty)</td>
<td>$685</td>
<td>$785</td>
</tr>
<tr>
<td>Associate Member</td>
<td>$685</td>
<td>$785</td>
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<tr>
<td>Senior</td>
<td>$370</td>
<td>$470</td>
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<tr>
<td>Non-Member Medical Student</td>
<td>$250</td>
<td>$350</td>
</tr>
<tr>
<td>Corporate Representative</td>
<td>$1250</td>
<td>$1350</td>
</tr>
</tbody>
</table>

*All international Residents must have their Program Director sign registration form. If registering online, a letter from your Program Director certifying that you are a Resident in a neurosurgical training program accredited by the ACGME and the residency Review Committee for Neurosurgery must be faxed to 972-349-7715 or e-mailed to cns@wyndhamjade.com within one week of completing registration.

**All international Fellows must attach letter from Program Coordinator verifying Fellow status within one week of completing registration.

***Non-Member/Non-Physician category is limited to scientists, engineers, etc. involved in neurosurgical research and/or product development not affiliated with non-exhibiting company.

IMPORTANT DATES TO REMEMBER

September 18
Advance Registration Discount and Housing Deadline

Registration Change/Cancellation Information
Full registration refunds, less a $100 processing fee, will be granted if written requests for cancellation are received by September 25, 2014. Course, seminar and event tickets will be refunded in full until September 25, 2014. No refunds of any kind will be given after this date regardless of cause. Refunds will not be given for no-shows. Written requests may be e-mailed to cns@wyndhamjade.com, faxed to 972.349.7715 or mailed to 6100 West Plano Parkway, Suite 3500, Plano, TX 75093.

Cancellation requests accepted via:

**E-mail:**
cns@wyndhamjade.com

**Fax:**
972.349.7715

**Mail:**
CNS Annual Meeting
CNS Registration and Housing
6100 W. Plano Pkwy, Suite 3500
Plano, TX 75093

October 10
Any changes to hotel reservations must be made directly with hotel from this date on.
**Hotel Reservation Information and Deadlines**

Hotel reservations are only available to registered CNS attendees. You must first register for the CNS Annual Meeting before making your hotel arrangements – see pages 60–61 for hotel details. Rooms are subject to availability. Reserve your room by **September 18, 2014**.

**Deposits**

A deposit of one night’s room and tax is due at the time your hotel reservation is made. This payment must be submitted with your registration fees. Credit cards will be charged in early September. Please make checks payable to applicable hotel and send to CNS Registration and Housing Center at 6100 West Plano Parkway, Suite 3500, Plano, TX 75093. All rooms are subject to applicable state and local taxes. A small portion of your room rate will be used to help defray the cost of registration and housing services. Hotel reservations requested without deposit will not be processed.

**Hotel Change/ Cancellation Policy**

The deadline date for new reservations is **October 8, 2014**.

- The hotel requires a deposit of one night’s room and tax to reserve your room. Please continue to make any reservations through the CNS housing bureau, Wyndham Jade, through October 8, 2014. Beginning October 10, and up to 72 hours prior to your arrival, changes and cancellations must be made with your assigned hotel.

- **Note:** Some hotels may charge an early departure fee. Any cancellations made within 72 hours of arrival date will result in forfeiture of your first night’s deposit and tax.

**Beginning October 10, 2014**

- All changes and cancellations must be made directly with the hotel.
- If cancellation notice is not received according to the hotel policy, the deposit may be forfeited.
- Check your hotel confirmation and contact the hotel directly for information.

**Complimentary Housing for CNS Resident Member Attendees**

Complimentary housing at the CNS Annual Meeting is available to a limited number of CNS Resident Members on a first-come, first-served basis.

To be considered for this program, CNS Resident Members must:

- Register for the CNS Annual Meeting by September 18.
- Complete a separate CNS Resident Housing Form by September 18. (Included with Resident Member registration materials and can also be found at www.cns.org).
- This form is to be sent directly to CNS via e-mail to info@cns.org, fax to 847 240 0804 or mail to 10 North Martingale Road, Suite 190, Schaumburg, IL 60173-2294.
- All residents enrolled in ACGME approved programs have been automatically given complimentary CNS Resident Membership.
- If you are not a CNS Resident Member, complete your application by August 26.

Residents who choose to reserve a room through the CNS Registration and Housing Center and are later accepted into the CNS Resident Housing Program are responsible for cancelling their original reservation.

**Thank You for Your Continued Support of the CNS!**

The CNS thanks you for your support in reserving your guest room through the official CNS Housing and Registration Center. The CNS, in negotiating contracts with convention centers and hotels, must commit to a minimum number of guest rooms. This commitment helps guarantee the availability of meeting space and helps control the cost of the meeting. A history of high utilization of our room block enables the CNS to negotiate better room rates for future meetings.

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### HOTEL ROOM RATES: (Rate includes tax)

<table>
<thead>
<tr>
<th>Hotel Name</th>
<th>SINGLE</th>
<th>DOUBLE</th>
<th>TRIPLE</th>
<th>QUAD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Westin Boston Waterfront</strong> (Headquarter Hotel)</td>
<td>$365.10</td>
<td>$365.10</td>
<td>$387.99</td>
<td>$410.88</td>
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<tr>
<td>Courtyard Boston Downtown</td>
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<tr>
<td>Fairmont Copley Plaza</td>
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<tr>
<td>Four Seasons Hotel Boston</td>
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<tr>
<td>InterContinental Boston</td>
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<tr>
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<tr>
<td>Renaissance Boston Waterfront</td>
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<tr>
<td>Seaport Boston Hotel</td>
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<tr>
<td>Sheraton Boston</td>
<td>$337.63</td>
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<tr>
<td>W Boston</td>
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<tr>
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<td>$406.30</td>
</tr>
</tbody>
</table>

*All hotel rates are inclusive of 14.45% tax
A small portion of your room rate will be used to help defray the cost of housing and registration services.*
**Westin Boston Waterfront – Headquarters Hotel**  
425 Summer Street, Boston, MA 02210  
*Attached to Boston Convention and Exhibition Center*  
**Amenities Include:**  
- High-speed Internet (complimentary to CNS guests)  
- Fitness center (complimentary to CNS guests)  
- On-site restaurant  
- 24-hour room service

**Courtyard Boston Downtown**  
275 Tremont St.  
Boston, MA 02116  
*1.6 miles to Boston Convention and Exhibition Center*  
**Amenities Include:**  
- High-speed Internet (complimentary to CNS guests)  
- Fitness center (complimentary to CNS guests)  
- Bistro: “Grab & Go”

**Four Seasons Hotel Boston**  
200 Boylston Street  
Boston, MA 02116  
*1.4 miles to Boston Convention and Exhibition Center*  
**Amenities Include:**  
- High-speed Internet (complimentary to CNS guests)  
- Fitness center (complimentary to CNS guests)  
- Coffee/specialty coffee, tea, pastries and fruit in the lobby from 5:00 – 8:00 AM on weekdays and 5:00 – 10:00 AM on weekends  
- Bottled water, refreshed daily

**InterContinental Boston**  
510 Atlantic Avenue  
Boston, MA 02210  
*1 mile to Boston Convention and Exhibition Center*  
**Amenities Include:**  
- High-speed Internet (complimentary to CNS guests)  
- Fitness center (complimentary to CNS guests)  
- Same-day dry cleaning service

**Marriott Boston Copley Place**  
110 Huntington Avenue  
Boston, MA 02116  
*2.2 miles to Boston Convention and Exhibition Center*  
**Amenities Include:**  
- High-speed Internet (complimentary to CNS guests)  
- Fitness center (complimentary to CNS guests)  
- 24-hour room service

**Renaissance Boston Waterfront**  
606 Congress Street  
Boston, MA 02210  
*3 miles to Boston Convention and Exhibition Center*  
**Amenities Include:**  
- High-speed Internet (complimentary to CNS guests)  
- Fitness center (complimentary to CNS guests)  
- Full service business center
**Seaport Boston Hotel**
1 Seaport Lane
Boston, MA 02210
.2 miles to Boston Convention and Exhibition Center
Amenities Include:
- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- 24-hour full service business center
- On-site restaurants

**W Boston**
100 Stuart Street
Boston, MA 02116
1.4 miles to Boston Convention and Exhibition Center
Amenities Include:
- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- Signature W Bed
- Room service

**Westin Copley Place**
10 Huntington Avenue
Boston, MA 02116
2.1 miles to Boston Convention and Exhibition Center
Amenities Include:
- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- Room service
- Business center

**Sheraton Boston Hotel**
39 Dalton Street
Boston, MA 02199
2.5 miles to Boston Convention and Exhibition Center
Amenities Include:
- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- Room service
- On-site restaurants
- Business center

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**HOTEL INFORMATION**

<table>
<thead>
<tr>
<th>HOTEL NAME</th>
<th>Distance (BCEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Westin Boston Waterfront</td>
<td>Connected</td>
</tr>
<tr>
<td>2 Seaport Hotel &amp; World Trade Center</td>
<td>2 blocks</td>
</tr>
<tr>
<td>3 Renaissance Boston Waterfront</td>
<td>3 blocks</td>
</tr>
<tr>
<td>4 Intercontinental</td>
<td>8 blocks</td>
</tr>
<tr>
<td>5 Four Seasons Hotel</td>
<td>1.3 miles</td>
</tr>
<tr>
<td>6 W Boston</td>
<td>1.3 miles</td>
</tr>
<tr>
<td>7 Courtyard Boston Downtown</td>
<td>1.5 miles</td>
</tr>
<tr>
<td>8 Fairmont Copley Plaza</td>
<td>2 miles</td>
</tr>
<tr>
<td>9 Westin Copley Place</td>
<td>2.2 miles</td>
</tr>
<tr>
<td>10 Marriott Copley Place</td>
<td>2.3 miles</td>
</tr>
<tr>
<td>11 Sheraton Boston</td>
<td>2.5 miles</td>
</tr>
</tbody>
</table>

Stay connected at http://m.cns.org
Airport
The CNS Annual Meeting hotels and Boston Convention and Exhibition Center are located approximately 6 miles from Boston Logan Airport (BOS).
Taxis are readily available outside of baggage claim at Boston Logan Airport.

Americans with Disabilities Act
Wheelchairs, scooters, information booths, designated parking, TDD telephones and other services are available for visitors with disabilities. For wheelchair/electric scooter rental, please contact ScootAround, Inc. at 1-888-441-7575, or by visiting their website at http://scootaround.com/rentals/rentals_conventions.htm

Please let us know if, under the ADA, you require special accommodations or services in order to attend the 2014 CNS Annual Meeting. We want to ensure that no individual with a disability is excluded because of the absence of auxiliary aids and services. Your requirements should be sent directly to the CNS Housing and Registration Center at: cns@wynnhamjade.com or call 1-800-931-9543. Please provide any requests at least 30 days prior to the Annual Meeting to guarantee accommodation.

Attire
Professional attire is appropriate at the Annual Meeting and the Exhibit Hall. Some Boston restaurants require coats and ties for gentlemen. Please check each restaurant’s policy when making reservations.

Spouse Hospitality Suite
All registered CNS Annual Meeting spouses and guests are invited to visit the Spouse Hospitality Suite, Monday through Wednesday for daily continental breakfast from 8:00 – 10:30 AM. (Please note that admittance to the Spouse Hospitality Suite is by Spouse/Guest badge only.) The Spouse Hospitality Suite is located in the Adams Room at the Boston Westin Waterfront Hotel.

Optional Evening Events are available to all registered attendees and our corporate supporters. We encourage you to share this information with your spouse or guest for their convenience when registering.

Children
Children over the age of 12 may register as a guest at the Guest Registration fee. (Please note that children under the age of 18 are not allowed in the Exhibit Hall.)

Should you require babysitting services, please contact the concierge desk at your hotel. The CNS has no control over and assumes no responsibility for the care that is provided through hotels or these services. This information is provided solely to assist participants in identifying possible sources for childcare.

Climate
October temperatures in Boston average a high of 64°F and a low of 49°F.

Course Agendas and Faculty
Agendas are occasionally subject to change. As we continue to strive to improve the quality of your educational experience, the CNS may substitute faculty with comparable expertise when necessary.

Digital Posters
Digital Posters will be displayed electronically, Monday through Wednesday in the Exhibit Hall, and can be searched by author, topic or keyword.

Disclaimer
The material presented at the 2014 Annual Meeting has been made available by the Congress of Neurological Surgeons for educational purposes only. The material is not intended to represent the only, nor necessarily the best, method or procedure appropriate for the medical situations discussed, but rather is intended to present an approach, view, statement or opinion of the faculty which may be helpful to others who face similar situations.

Neither the content (whether written or oral) of any course, seminar or other presentation in the program, nor the use of a specific product in conjunction therewith, nor the exhibition of any materials by any parties coincident with the program, should be construed as indicating endorsement or approval of the views presented, the products used, or the materials exhibited by the CNS or by its Committees or Affiliates.

The CNS disclaims any and all liability for injury or other damages resulting to any individual attending the Annual Meeting, and for all claims which may arise out of the use of the techniques demonstrated therein by such individuals, whether these claims shall be asserted by physicians or any other person.

No reproductions of any kind, including audiotapes and videotape, may be made of the presentations at the CNS Annual Meeting. The CNS reserves all of its rights to such material, and commercial reproduction is specifically prohibited.

E-mail Stations
You will be able to check your e-mail at the E-mail Stations in the Exhibit Hall. Please be sure to have your mail server URL, e-mail account username and password.
Exhibit Hall
Monday, Oct. 20 8:30 AM – 4:15 PM
Tuesday, Oct. 21 8:30 AM – 4:15 PM
Wednesday, Oct. 22 10:00 AM – 1:00 PM

Admittance to the Exhibit Hall is by the CNS name badge only. Children under the age of 18 are not allowed in the CNS Exhibit Hall.

Future Meetings
2015: New Orleans, Louisiana, September 26 – 30
2016: San Diego, California, September 24 – 28
2017: Boston, Massachusetts, October 7 – 11

Housing Information
See pages 59 - 61.

Items included in Registration Fee
Admission to Sunday – Wednesday:
• General Scientific Sessions
• Original Science Program

Admission Monday – Wednesday
• Consensus Sessions
• Section Sessions
• Exhibit Hall, Beverage Breaks
• Hot Topic and Controversy Sessions

One Ticket to:
• Opening Reception on Sunday, October 19
(Note: Children under the age of 18 are not allowed on the exhibit floor.)

Member Services Booth
The CNS Member Services Booth is located in the Exhibit Hall. Staff members will be available to assist you and answer any questions you may have about the CNS or your CNS Membership and its member services.

Press Room
Press activities will take place at the Boston Convention and Exhibition Center. Press registration is available on-site with proper credentials. Please stop by the Registration area for details.

Registration Information
Registration Hours:
Saturday, Oct. 18 7:00 AM – 5:30 PM
Sunday, Oct. 19 7:00 AM – 7:30 PM
Monday, Oct. 20 6:30 AM – 4:30 PM
Tuesday, Oct. 21 6:30 AM – 4:30 PM
Wednesday, Oct. 22 6:30 AM – 3:00 PM

Shuttle Services
Complimentary shuttle service to the Boston Convention and Exhibition Center will be available from official CNS hotels located more than four blocks away from the convention center. A shuttle schedule will be posted at the hotels and convention center.

Smoking
Boston Convention and Exhibition Center and official CNS hotels are non-smoking facilities. There are designated areas outside the buildings where smoking is permitted.

Speaker Ready Room
All speakers and abstract presenters should visit the Speaker Ready Room at the Boston Convention and Exhibition Center prior to their presentations.

Visa Information
The State Department of the United States encourages international participants to apply for their visas as early as possible – at least 3 months before the meeting. Some consulates may have backlogs in scheduling visa interviews so applicants should first contact the consulate to find out how long the wait is for an interview. Visa wait times are available at: http://travel.his.com/visa/temp/wait/wait_4638.html.

For information on the visa process, please visit www.nationalacademies.org/visas. The US State Department’s visa site contains the official information on the visa application process: http://travel.his.com/visa.
2014 EXHIBITORS

Accuray
Ad-Tech Medical Instrument Corp.
Advanced Biologics
Allen Medical Systems, Inc.
Alpha Omega Co. USA Inc.
Alphatec Spine, Inc.
Amedica Corporation
American Association of Neurological Surgeons
American Surgical Company
Anatom-e Neuro Information Systems, Ltd.
Apex Medical, Inc.
Arbor Pharmaceuticals, Inc.
Arbor Pharmaceuticals, Inc.
ASSI-Accurate Surgical
Baxano Surgical, Inc.
BaylorScott & White Health BeckerSmith Medical
Benvenue Medical, Inc.
BioDiogics, LLC
Biomet Microfixation
Bioplate, Inc.
BK Medical / Analogic Ultrasound
Boss Instruments, Ltd.
Boston Scientific
The Brain Aneurysm Foundation
Brainlab
Carl Zeiss Meditec
Centinel Spine
CFI Medical
CMF Medicon Surgical Inc.
Cosman Medical
Covidien
Designs For Vision, Inc.
DFine Inc.
DJO Global
Electrical Geodesics, Inc.
ELEKTa, Inc.
elliquence
Elsevier, Inc.
Fehling Surgical Instruments
Frontier Devices
Gauthier Biomedical
Globus Medical
Haag-Streit Surgical
Hawaiian Moon
Hayes Locums
HCA – Hospital Corporation of America
Hemedex, Inc.
Hitachi Aloka Medical
IMRIS
Inion Inc.
Innerspace Neuro, Inc.
Integra
Journal of Neurosurgery
K2M, Inc.
Kaiser Permanente – Southern California
Karl Storz Endoscopy
Kelyniam Global, Inc.
Kinamed, Inc.
Kirwan Surgical Products LLC
KLS Martin Group
Kogent Surgical
Koros USA, Inc.
LDR Spine
Leica Microsystems
Life Instrument Corporation
Mazor Robotics
Medtech Surgical
MicroVention
Misonix, Inc.
Mizuho America, Inc.
Monteris Medical
MRI Interventions Inc.
Nadia International Inc
NeuroLogica Corporation
NeuroPoint Alliance
Neurospectrum
Neurosurgery Research and Education Foundation
Newport Surgical Instruments, Inc.
Nexstim, Inc.
NICO Corporation
North American Neuromodulation Society
North American Spine Society
NovaBone Products LLC
NSI
NuTech
Oncology Data Systems / Mu-Check
Orthofix
OsteoMed
OsteoSymbionics, LLC
Pacira Pharmaceuticals
Paradigm BioDevices Incorporated
Paradigm Spine, LLC
Penumbra, Inc.
Peter Lazic US Inc.
Pfizer, Inc.
Pikeville Medical Center, Inc.
Pionira Medical
PMT Corporation
Precision Spine Inc.
pro med instruments, Inc.
Pro-Dex OMS
Providence Medical Technology, Inc.
Raumedic, Inc.
Renishaw, Inc.
Rose Micro Solutions
RosmanSearch, Inc.
RTI Surgical
Scanlan International, Inc.
ShuntCheck Inc.
SI-BONE, Inc.
Sophysa USA, Inc.
Southern Spine LLC
Spinal Simplicity
Spine Surgery Today and Healio.com by SLACK Inc.
Spine Wave Inc.
Spineology Inc.
SpineVision
St. Jude Medical
Stability Biologics
Stryker
Surgical Theater LLC
SurgitTel
Synaptive Medical
TeDan Surgical Innovations, LLC
Thieme Medical Publishers, Inc.
Thompson Surgical Instruments, Inc.
Titan Spine
Varian Medical Systems, Inc.
Visualase, Inc.
Vycor Medical, Inc.
Webb Dordick, Rare Medical Books
Wenzel Spine, Inc.
Wolters Kluwer Health – Lippincott Williams & Wilkins
X-spine Systems, Inc.
Zimmer Spine

List as of June 20, 2014
For more than 50 years, Medtronic has partnered with physicians to pioneer innovative medical technologies and treatments. This commitment to discovery has made us the market leader in neuroscience, with the broadest portfolio of treatments and therapies to alleviate pain and restore health. Together, we’re driving the breakthroughs patients need, every day.

neuroscience.medtronic.com