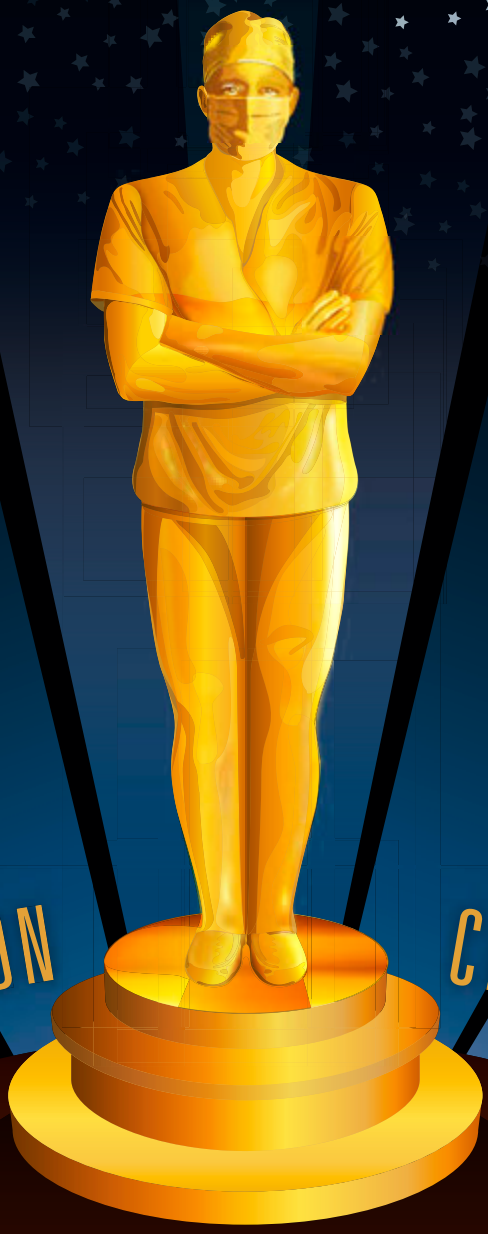
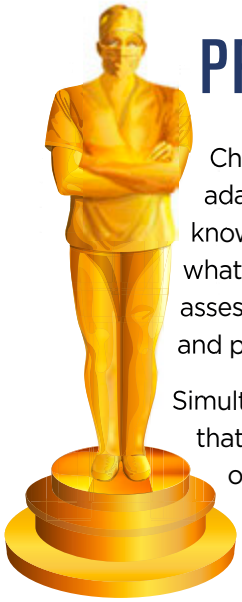
CNS PRELIMINARY PROGRAM

Register at cns.org/2017
Advance Registration Deadline: September 7, 2017



TRANSFORMATION CELEBRATION

CONGRESS OF NEUROLOGICAL SURGEONS
2017 ANNUAL MEETING
BOSTON, MASSACHUSETTS ★ OCTOBER 7–11, 2017



PRESIDENT'S MESSAGE

Change is inevitable. In the moments that pass as you read this, mountains erode, plants and animals adapt, and stars dim—all in imperceptibly slow motion. In a similar way, our profession changes. As our knowledge grows exponentially and technology accelerates, we must also adapt and transform into what is possible. Essentially, this has been the core of every CNS Annual Meeting for the past 67 years—to assess our reality, anticipate a better future, point our collective energies in the direction of that future, and prepare for the change we must create.

Simultaneously, it is also important to note all that we have accomplished. Neurosurgery can proudly say that what was lethal only a few generations ago, is now survivable. Our ongoing achievements deserve our admiration and are cause for celebration. This paradox between all we have done and all that we have left to do is what drives us to become better. It is also the driving concept behind this year's CNS Annual Meeting theme *Transformation and Celebration*.

Within this Preliminary Program, you will see dozens of educational programs and sessions containing both today's state-of-the-art neurosurgery and insight into how neurosurgery is changing. You will find some courses that look familiar and some that are completely new. Some formats that were once didactic and lecture-driven have been transformed into interactive and hands-on. All this is to provide you, our members and longtime patrons, with education that is more relevant, contemporary, and innovative than ever before.

You will also see a number of celebrations during the plenary sessions, when we will be honoring the best papers from *Neurosurgery* as well as the top innovation in our specialty. We hope you welcome this acknowledgement of how our best and brightest are pushing the envelope of what is possible, and creating the change that will continue to make neurosurgery the great passion of our professional lives.

On behalf of the Congress of Neurological Surgeons Executive Committee, the Scientific Program Committee, and the 2017 CNS Honored Guest Alan R. Cohen, MD, I warmly invite you to attend this year's CNS Annual Meeting in Boston, Massachusetts, October 7–11, 2017.

I look forward to seeing you in Boston!

SINCERELY,
ALAN M. SCARROW, MD, JD
CNS PRESIDENT

We welcome our colleagues from the Neurological Society of India—our international partner for the 2017 CNS Annual Meeting.

The purpose of the 2017 Annual Meeting of the Congress of Neurological Surgeons is to provide continuing medical education for practicing neurosurgeons, neurosurgical residents in training, and postgraduate neurosurgical fellows, as well as advanced practice providers including nurses, physician assistants, and clinical specialists.

Who should attend: Neurological surgeons, neurosurgery nurses, physician assistants, orthopedic surgeons, primary care physicians, gerontologists, radiologists, hospital administrators, oncologists, neurologists, pediatricians, physiatrists, and infectious disease specialists.

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2017 AT-A-GLANCE

SATURDAY, OCTOBER 7

8:00 am–5:00 pm	Symposium 1: Functional Neurosurgery Update
8:00 am–4:00 pm	Full-day Practical Course (PC01)
8:00–11:30 am	Morning Practical Courses (PC02–PC06)
12:30–4:00 pm	Afternoon Practical Courses (PC07–PC13)
5:00–6:30 pm	International Reception
6:30–8:30 pm	Dinner Seminar (DIN1): The World is Changing Around Us—New CPT Codes, ICD-10, MIPS, and Bundling: Does This Affect My Bottom Line?

SUNDAY, OCTOBER 8

8:00 am–4:00 pm	Symposium 2: Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon
8:00 am–4:00 pm	Symposium 3: Neurocritical Care and Neurosurgical Emergencies Update
8:00 am–4:00 pm	Full-day Practical Courses (PC14–PC16)
8:00–11:30 am	Morning Practical Courses (PC17–PC21)
12:30–4:00 pm	Afternoon Practical Courses (PC22–PC33)
1:00–3:00 pm	CNS Resident SANS Challenge: Preliminary Rounds
4:30–6:30 pm	General Scientific Session I
6:30–8:30 pm	CNS Opening Reception Boston Convention & Exhibition Center

MONDAY, OCTOBER 9

7:00–8:30 am	Guidelines Sessions
8:45–9:45 am	General Scientific Session II
9:45–10:45 am	Beverage Break in the Exhibit Hall
9:45 am–12:15 pm	General Scientific Session II, continued
12:15–1:45 pm	Luncheon Seminars (M01–M14)
12:15–1:45 pm	Industry Sponsored Lunch Symposia
1:45–2:45 pm	Beverage Break in the Exhibit Hall
2:00–2:30 pm	Live Surgery in the Exhibit Hall
2:45–4:15 pm	Section Sessions and Oral Presentations
4:15–6:15 pm	Case-based Discussion Sessions
7:30–9:30 pm	Dinner Seminar (DIN2): Frontiers in Spine Surgery: Artificial Discs, Robotics/ Navigation, Spinal Endoscopy, and Minimally Invasive Surgery Dinner Seminar (DIN3): Skull Base Tumors: Contemporary Management

TUESDAY, OCTOBER 10

7:00–8:30 am	Rapid-exchange Oral Presentation Session 1 and Late-breaking Abstracts
8:45–9:45 am	General Scientific Session III
9:45–10:45 am	Beverage Break in the Exhibit Hall
9:45 am–12:15 pm	General Scientific Session III, continued
12:15–1:45 pm	Luncheon Seminars (T15–T27)
12:15–1:45 pm	Industry Sponsored Lunch Symposia
1:45–2:45 pm	CNS Resident SANS Challenge: Championship Round
1:45–2:45 pm	Beverage Break in the Exhibit Hall
2:00–2:30 pm	Live Surgery in the Exhibit Hall
2:00–2:45 pm	Annual Business Meeting
2:45–4:15 pm	Section Sessions and Oral Presentations
4:15–6:15 pm	Case-based Discussion Sessions
6:15–7:15 pm	Resident Recruitment Social
7:30–9:30 pm	Dinner Seminar (DIN4): Global Neurosurgery

WEDNESDAY, OCTOBER 11

7:00–8:30 am	Rapid-exchange Oral Presentation Sessions 2 and 3
8:45–9:45 am	General Scientific Session IV
9:45–10:45 am	Beverage Break in the Exhibit Hall
10:00–10:30 am	Live Surgery in the Exhibit Hall
9:45 am–12:15 pm	General Scientific Session IV, continued
12:15–1:45 pm	Luncheon Seminars (W28–W39)
12:15–1:45 pm	Industry Sponsored Lunch Symposia
1:45–2:45 pm	Beverage Break in the Exhibit Hall
2:45–4:15 pm	Symposium 4: Big Data

#2017CNS
CONNECT WITH THE CNS. Follow us on Twitter, Facebook, and Instagram for the most up-to-date information and meeting updates.

HONORED GUEST

Alan R. Cohen, MD, FACS, FAAP

Professor of Neurological Surgery, Chief of Pediatric Neurosurgery
Johns Hopkins University School of Medicine, Baltimore, Maryland

Alan R. Cohen was born in New York City and raised in Poughkeepsie, New York. He graduated *summa cum laude* from Harvard University, where he was elected to Phi Beta Kappa. He obtained his MD degree at Cornell Medical College and went to the Dartmouth Hitchcock Medical Center to begin a career in internal medicine. He soon moved to New York City to do general surgery at the New York University Medical Center. While there, he was influenced by Joseph Ransohoff, Eugene Flamm, and Fred Epstein, and went on to complete a neurosurgical residency at NYU, which included a fellowship in neurology at the National Hospital, Queen Square, London, England.

Dr. Cohen joined the faculty of the Tufts University School of Medicine where he served as director of pediatric neurosurgery for seven years. He spent the next 17 years at Case Western Reserve University School of Medicine, where he was chief of pediatric neurosurgery and surgeon-in-chief at Rainbow Babies and Children's Hospital, the Reinberger Professor of Neurological Surgery, and pediatrics and residency program director. In 2016, he moved to Johns Hopkins where he is chief of pediatric neurosurgery and the Carson Spiro Professor of Pediatric Neurosurgery.

He has served as president of the Society of Neurological Surgeons, president of the American Society of Pediatric Neurosurgeons, president of the Boston Society of Neurology and Psychiatry, president of the Ohio State Neurosurgical Society, chairman of the AANS/CNS Joint Section on Pediatric Neurological Surgery, and vice president of the American Academy of Neurological Surgery. He is a director of the American Board of Pediatric Neurological Surgery and a director of the American Board of Neurological Surgery.

His primary clinical interests are pediatric brain tumors and minimally invasive neurosurgery. His research interests have focused on novel surgical approaches and minimally invasive neurosurgery.

LOOK FOR DR. COHEN AT THE FOLLOWING SESSIONS:

MO OCT 9
8:55–9:15 am: Honored Guest Presentation: Humility
12:15–1:45 pm: Honored Guest Luncheon: The Art of the Talk

TU OCT 10
11:43 am–12:03 pm: Honored Guest Presentation: Simplicity

WE OCT 11
8:53–9:13 am: Honored Guest Presentation: Curiosity

FEATURED SPEAKERS

Richard Susskind

The Future of the Professions

Professor Richard Susskind, OBE, is an author, speaker, and independent adviser to major professional firms and national governments. His main area of expertise is the future of professional service and, in particular, the way in which IT and the internet are changing the work of lawyers. He has worked on legal technology for more than 30 years.

Susskind lectures internationally and has been invited to speak in more than 40 countries. He's addressed audiences totaling more than 250,000, both in person and virtually. He has written and edited numerous books, including *Expert Systems in Law, The Future of Law, Transforming the Law, The Susskind Interviews: Legal Experts in Changing Times, The End of Lawyers? Rethinking the Nature of Legal Services, Tomorrow's Lawyers,* and has written approximately 150 columns for *The Times.* His work is translated into ten different languages.

Richard Susskind will be signing copies of his book The Future of the Professions: How Technology Will Transform the Work of Human Experts immediately following the conclusion of this session.

SU OCT 8
4:52–5:12 pm
General Scientific Session I

Jamie Holmes

The Need for Closure in the Workplace: How Handling Ambiguity Well Improves Decision-making, Creativity, and Empathy

Jamie Holmes is a Future Tense Fellow at New America and a former research coordinator at Harvard University in the Department of Economics. He holds an M.I.A. from Columbia's School of International and Public Affairs, and his writing has appeared in *The New Yorker, The New York Times, Slate, Politico, Christian Science Monitor, New Republic, Atlantic, Foreign Policy,* and *The Daily Beast.* Holmes is consistently at the forefront of emerging technology and how it is changing the way the world works, including an in-depth analysis of why text messaging was the most important information service in the world for *Atlantic* in 2011, and a review of the impact of method-videos on science for *The New Yorker* in 2015.

Jamie Holmes will be signing copies of his book Nonsense: The Power of Not Knowing immediately following the conclusion of this session.

SU OCT 8
5:15–5:45 pm
General Scientific Session I

FEATURED SPEAKERS

Brett King

AUGMENTED: Life in the Smart Lane

Brett King is a five-time Amazon bestselling author, a renowned commentator, and globally respected speaker on the future of business. He has spoken on how technology is disrupting business, changing behavior, and influencing society in more than 40 countries. He has spoken at TED conferences, and given opening keynotes for *Wired*, Singularity University's Exponential Finance, *The Economist*, and many more. He visited the White House to advise the National Economic Council on the Future of Banking and was invited to meet with regulators from the United States, China, the European Union, and the World Bank.

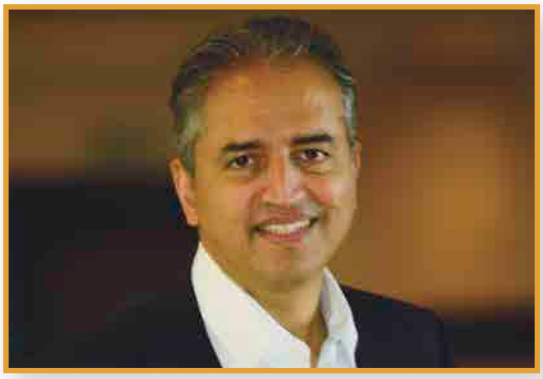
King hosts the world's leading dedicated radio show on technology impact in banking and financial services called "Breaking Banks," which airs in 72 countries with one million listeners. He is also the founder of Moven, a successful mobile start-up that has raised over $24 million to date, with the world's first mobile, downloadable bank account, available in the United States, Canada, and New Zealand.

MO OCT 9
9:18–9:45 am
General Scientific Session II

Brett King will be signing copies of his book AUGMENTED: Life in the Smart Lane at the CNS Member Services Booth in the Exhibit Hall immediately following his presentation.

Devi Prasad Shetty, MD, FRCS

Affordable Health Care



Dr. Devi Prasad Shetty is the chairman and senior consultant cardiac surgeon at the Narayana Group of Hospitals in Bangalore, India. He received his MS in general surgery from Kasturba Medical College, Mangalore, and is a fellow of the Royal College of Surgeons, England. He is the recipient of several high-profile and prestigious awards, including the Padma Bhusan, the third-highest civilian award conferred by the Indian government, in 2012. He performed India's first heart surgery on a newborn 25 years ago, and built a large pediatric cardiac surgical program in India that performs approximately 30 major heart surgeries daily.

Dr. Shetty is recognized for his thought leadership in creating national health policies and developing ingenious solutions for affordable healthcare delivery in Third World countries. He conceptualized the idea of "micro-health insurance," which makes surgery affordable for rural farming families. Using his idea and guidance, Yeshaswini Micro Health Insurance was launched by the Government of Karnataka state. Farmers paid a premium of five cents per month to gain access to more than 800 surgeries at 400 hospitals across the state. Today, 3.5 million farmers are enrolled at a premium of 30 cents. Through this groundbreaking program, more than 580,000 surgeries have been performed, 70,000 of which were heart surgeries. Yeshaswini is now the largest micro health insurance program in the world.

TU OCT 10
10:50–11:10 am
General Scientific Session III

Dr. Shetty leads the Narayana Group of Hospitals, which includes 29 hospitals in 17 cities, and has helped to implement the world's largest telemedicine program, with more than 53,000 consultations completed thus far.

FEATURED SPEAKERS

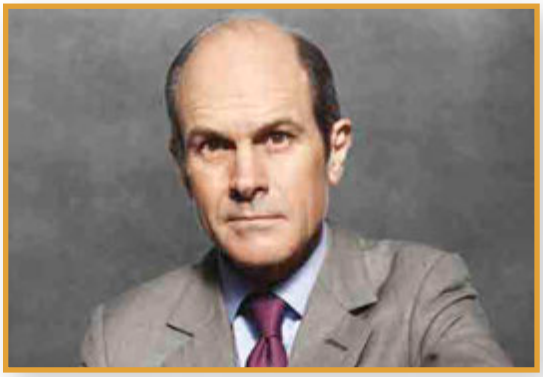
Bernard J. Tyson

Bernard J. Tyson is the chairman and CEO of Kaiser Foundation Health Plan, Inc. and Hospitals—known as Kaiser Permanente, one of America's leading integrated health care providers and not-for-profit health plans. Tyson assumed the role of chairman in January 2014 and has served as CEO since 2013. His career at Kaiser Permanente has spanned more than 30 years. In 2016, Modern Healthcare named him the second most influential leader in health care. In April 2017, he was included on the TIME 100 list of the most influential people in the world.

Under Tyson's leadership, Kaiser Permanente continues to focus on providing affordable, accessible, high-quality health care and improving the health of its members and communities. Kaiser Permanente's 200,000 employees and 20,000 physicians (with Permanente Medical Groups) provide personalized, coordinated, and technologically advanced care that consistently delivers some of the best clinical outcomes in the nation, while also leading the country in prevention, patient safety, and quality.

Tyson serves on the board of directors of the American Heart Association (AHA) and is a member of AHA's CEO Roundtable, which is focused on workforce wellness. He is a deputy chairman of the International Federation of Health Plans and is on the board of America's Health Insurance Plans. Tyson is also a steward of the World Economic Forum's Global Challenge on the Future of Health.

TU OCT 10
11:13–11:37 am
General Scientific Session III



Geoff Colvin

Humans are Underrated—Building the New High-level Skills

Geoff Colvin is an award-winning thinker, author, broadcaster, and speaker on the most significant trends and issues impacting business and the economy. As *Fortune* magazine's senior editor-at-large, Colvin has an insider's perspective fueled by longstanding relationships with the world's top leaders in business and government. He knows what they're seeing, thinking, and planning and reveals how they're leading, making choices, and responding to today's challenges in ways that others can learn from.

Colvin's regular column and frequent cover stories in *Fortune* earned him millions of loyal readers, and his Power Sheet newsletter provides a detailed look at how individual leaders are shaping today's tumultuous world. Colvin is one of America's preeminent business broadcasters heard every day on the CBS Radio Network, where he's made more than 10,000 broadcasts, reaching seven million listeners each week. He has appeared on *Today, The O'Reilly Factor, Good Morning America, Squawk Box, CBS This Morning, ABC's World News Tonight, CNN, PBS's Nightly Business Report*, plus more. He also served as anchor of *Wall $treet Week with Fortune* on PBS.

Colvin is the international best-selling author of *Talent Is Overrated: What Really Separates World-Class Performers from Everybody Else, The Upside of the Downturn: Management Strategies for Difficult Times,* and *Humans are Underrated: What High Achievers Know That Brilliant Machines Never Will.*

Geoff Colvin will be signing copies of his book Humans Are Underrated: What High Achievers Know That Brilliant Machines Never Will at the CNS Member Service Booth in the Exhibit Hall immediately following his presentation.

WE OCT 11
9:15–9:45 am
General Scientific Session IV

FEATURED SPEAKERS

Kathy McGroddy Goetz, PhD

Kathy McGroddy Goetz, PhD, is the vice president of Global Partnerships & Alliances Management for IBM Watson Health. She is responsible for managing strategic collaborations with key industry leaders to address the world's most pressing health challenges. She also manages the ongoing relationship with IBM Research to foster continuing innovation for the future.

Dr. McGroddy Goetz has spent much of her 24-year career at IBM innovating at the intersection of advanced technologies and new business models, with an emphasis on healthcare and life sciences solutions. She spent two years as Director of Corporate Technology, leading IBM's technology strategy, and has significant expertise in developing innovative medical imaging solutions. She also played a critical role in the corporation's launch of Watson Health, called a "moon shot" by CRO Ginni Rometty.

WE OCT 11
10:47–11:12 am
General Scientific Session IV

Dr. McGroddy Goetz earned a BS in physics from SUNY Binghamton and a PhD in molecular biophysics from Cornell University, where she studied protein-ligand interactions using NMR spectroscopy and molecular dynamics simulations.

Anders Ericsson, PhD

Peak Performance: The Making of an Expert Performer

Anders Ericsson, PhD, Conradi Eminent Scholar and Professor of Psychology at Florida State University, is the world's foremost authority on expertise. His newest book, *Peak: Secrets from the New Science of Expertise* (co-authored with Robert Pool), builds upon decades of original research to provide a powerful approach to learning new skills and becoming an expert in any field, thanks to deliberate, purposeful practice.

Dr. Ericsson has also edited several books on expertise, such as the influential *Cambridge Handbook of Expertise and Expert Performance,* and the recent *Development of Professional Expertise.* His research has been featured in cover stories in *Scientific American, Time, Fortune, The Wall Street Journal,* and *The New York Times*. He's given keynote presentations at conferences of surgeons and other varied professions, as well as professional sports organizations around the world.

Dr. Ericsson collaborated with the Nobel Prize winner in Economics Herbert A. Simon on verbal reports of thinking, leading to their classic book *Protocol Analysis: Verbal Reports as Data,* and has published articles in prestigious journals such as *Science, Academic Medicine, Psychological Review, Psychological Bulletin, Academic Emergency Medicine, Current Biology,* and *Trends of Cognitive Science*.

WE OCT 11
11:16–11:41 am
General Scientific Session IV

Anders Ericsson will be signing copies of his book Peak: Secrets from the New Science of Expertise at the CNS Member Service Booth in the Exhibit Hall at the conclusion of this session.

ANNUAL MEETING LEADERSHIP

PRESIDENT

ALAN M. SCARROW, MD, JD

Dr. Scarrow currently serves as president of Mercy Health System for the Springfield Communities in Missouri, where he has practiced for 13 years. He graduated from Case Western Reserve University School of Medicine in 1996. After a surgical internship at the University Hospitals of Cleveland, he completed his neurosurgical residency at the University of Pittsburgh Health Center. In addition to being a neurosurgeon, Dr. Scarrow also holds a Doctor of Jurisprudence (JD) from Case Western Reserve University School of Law. The combination of medical and law degrees gives him a unique insight into many of the nation's medicolegal issues.

Dr. Scarrow has served on the Executive Committee of the Congress of Neurological Surgeons since 2005 having served as the Secretary, Annual Meeting and Scientific Program Chair prior to being elected President.

Dr. Scarrow also writes a monthly blog where he discusses current medical topics focused primarily on his experiences and the work done by the Mercy Health System. He has held numerous leadership roles at Mercy including Mercy Clinic Springfield Communities president, Neurosurgery Section chairman, Neuroscience Operating Group chairman, St. John's Mercy Radiosurgery Center medical director, and St. John's Mercy Spine Center medical director.

He is a native of Fairbury, Nebraska and is married to Meera Scarrow, MD, JD, who is an OB/GYN at Mercy Health System in Springfield. They have three children: Evelyn (15), William (12), and Harrison (9). In their off time, the Scarrows enjoy working on their Angus cattle farm.

PRESIDENT-ELECT

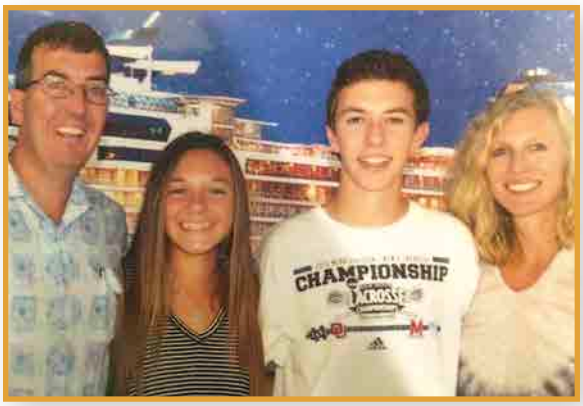
ASHWINI D. SHARAN, MD

Dr. Sharan is a professor of neurological surgery and neurology at Sidney Kimmel Medical College at Thomas Jefferson University, as well as the Division Director of Functional and Epilepsy Surgery, and the Neurosurgery Residency Program Director. He is a graduate of Boston University and the University of Medicine of Dentistry of New Jersey. He completed his residency in neurosurgery at Thomas Jefferson University and his fellowship in spine and functional neurosurgery at the Cleveland Clinic.

Dr. Sharan is an internationally recognized authority on functional neurosurgery, particularly for his contributions to the growing field of epilepsy surgery. Dr. Sharan also takes a keen interest in spine surgery, deep brain stimulation, intrathecal pumps, and spinal cord stimulators.

Dr. Sharan has been the recipient of three NIH grants, investigating the safety of MRI for patients with implanted DBS systems, genetic influences of human epilepsy, and neuronal dysfunction in AIDS. His work has been published in *Neurology, Neurosurgery, Spine, Epilepsia, Neuromodulation,* and *Orthopedic,* among others, and has been cited over 2,200 times. Dr. Sharan currently serves as the President of the North American Neuromodulation Society (NANS) and President Elect of the Congress of Neurological Surgeons (CNS).

He lives in Southern New Jersey with his wife, Kanu Priya Sharan, a breast cancer oncologist, and two children, Isha Priya and Maansi Dayal.



ANNUAL MEETING CHAIR

JAMES S. HARROP, MD, FACS

Dr. Harrop is professor of neurological and orthopedic surgery at the Sidney Kimmel Medical College of Thomas Jefferson University. He is the director of the Neurosurgery Department's Spine and Peripheral Nerve Surgery Program and co-chief of the TJHU Spine Service. In addition, he is the neurosurgical director of the Delaware Valley Model SCI Center, which is designated as one of the nation's 14 Model Spinal Cord Injury Centers by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) within the Administration for Community Living (ACL), Department of Health and Human Services (HHS).

Dr. Harrop completed a neurosurgical residency at Thomas Jefferson University Hospital that included a six-month designated rotation in pediatric neurosurgery at the Children's Hospital of Philadelphia. He also completed a combined neurosurgical and orthopedic spine fellowship at the Cleveland Clinic in 2002.

He is actively involved in academic research and has over 290 peer-reviewed publications and over 160 chapters on spinal disorders. His research is funded through numerous agencies including NIH, DOD, PICORI. He is actively involved in numerous organizations and projects within the CNS and has served as the director of both the Publications and the Simulation Committees.

He and his wife, Elyse, enjoy traveling with their two children, Matthew and Casey.

SCIENTIFIC PROGRAM CHAIR

BRIAN L. HOH, MD

Dr. Hoh is the James & Brigitte Marino Family Professor and Associate Chair of Neurosurgery, and chief of the Division of Cerebrovascular Surgery at the University of Florida. He earned his BAS from Stanford University, his MD with AOA honors from Columbia University College of Physicians & Surgeons, and his neurosurgical residency training and fellowship in interventional neuroradiology at Massachusetts General Hospital.

In addition to serving on the CNS Executive Committee, Dr. Hoh is a past-chair and past-treasurer of the AANS/CNS Joint Cerebrovascular Section. He is co-chair of the editorial board of the *Journal of Neurosurgery.*

Dr. Hoh's clinical and surgical interests are centered on the microsurgical and endovascular treatment of cerebrovascular diseases and conditions. He is also an NIH R01-funded principal investigator of basic science research, investigating the biologic mechanisms of cerebral aneurysm formation and rupture, as well as innovative tissue engineering technology to improve the treatment of cerebral aneurysms.

Dr. Hoh is also a leader in neurosurgical education at the University of Florida, where he is a past-program director of the neurosurgery residency and past-fellowship director of the endovascular surgical neuroradiology fellowship.

Dr. Hoh is married to Melissa, an ICU nurse, and they have three children: Jacqueline, Brandon, and Vivienne.

ANNUAL MEETING COMMITTEE

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SCIENTIFIC PROGRAM CHAIR
BRIAN L. HOH, MD

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Adam Kanter
V. Rajshekhar
Atul Goel
Sanjay Behari
B.S. Sharma

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Craig H. Rabb
Kathryn Beauchamp
Alan Hoffer
Deepak Gupta

Section on Pain
Jason Schwalb
Erika Petersen
Sean Nagel

Section on Pediatric Neurological Surgery
Lissa Baird
Elias Rizk
Sandi Lam
Sandeep Chatterjee

Section on Stereotactic and Functional Neurosurgery
Ron Alterman
Jonathan Miller
Nader Pouratian
Paresh K. Doshi
Sarat P. Chandra

Section on Tumors
Jason Sheehan
Adam Robin
Pamela Jones
C.E. Deopujari
Deepu Banerji
Suresh Nair
R.C. Mishra
V.P. Singh
Ashish Suri

Women in Neurosurgery
Stacey Wolfe
Ann Parr
Jennifer Sweet

SUBSPECIALTY SESSION HIGHLIGHTS

CV = CEREBROVASCULAR

SA OCT 7

8:00–11:30 am

PC02 Advanced Cerebrovascular Surgery: 2D and 3D Operative Video-based Surgical and Anatomical Pearls

PC03 Thrombectomy Tips and Tricks

12:30–4:00 pm

PC09 New Devices and Technology in Cerebrovascular Neurosurgery (Includes Aneurysm Treatment, ICH, Stroke)

PC10 Complications in Cerebrovascular Neurosurgery

SU OCT 8

8:00 am–4:00 pm

SYM2 Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon

MO OCT 9

7:00–8:30 am

Guidelines on Neurovascular Update

12:15–1:45 pm

Luncheon Seminars

M02 7 Aneurysms

M03 Hematology and Coagulation for Neurosurgeons

2:45–4:15 pm

Section on Cerebrovascular Surgery

4:15–6:15 pm

Case-based Discussion Session—Aneurysms

TU OCT 10

12:15–1:45 pm

Luncheon Seminar

T15 Dural AV Fistula Diagnosis and Management

2:45–4:15 pm

Section on Cerebrovascular Surgery

4:15–6:15 pm

Case-based Discussion Session—AVMs/Dural Arteriovenous Fistulas

WE OCT 11

12:15–1:45 pm

Luncheon Seminars

W29 Flow Diversion and Intra-saccular Devices: An Update

W30 Venous Stenting for Pseudotumor

SUBSPECIALTY SESSION HIGHLIGHTS

TR = NEUROTRAUMA

SA OCT 7

12:30–4:00 pm
PC13 Sports Concussions: Acute Management, Return to Activity, and Possible Short- and Long-term Sequelae

SU OCT 8

8:00 AM–4:00 pm
SYM3 Neurocritical Care and Neurosurgical Emergencies Update

8:00–11:30 am
PC16 Spinal Trauma: Case-based Presentations and Guidelines Update

MO OCT 9

7:00–8:30 am
Guidelines on Neurotrauma Update

12:15–1:45 pm
Luncheon Seminar
M10 Diagnosis and Management of Concussion and Athletic Clearance

2:45–4:15 pm
Section on Neurotrauma and Critical Care

4:15–6:15 pm
Case-based Discussion Session—Traumatic Brain Injury

TU OCT 10

12:15–1:45 pm
Luncheon Seminar
T24 Managing ICP in the Trauma Patient

2:45–4:15 pm
Section on Neurotrauma and Critical Care

4:15-6:15 pm
Case-based Discussion Session—Thoracolumbar Spine

WE OCT 11

12:15–1:45 pm
Luncheon Seminar
W33 Pediatric Head Trauma

Map out your meeting with this subspecialty-specific guide.

PA = PAIN

SA OCT 7

8:00 am–5:00 pm
SYM1 Functional Neurosurgery Update

SU OCT 8

12:30–4:00 pm
PC29 Neurosurgical Treatment of Chronic Headache

MO OCT 9

2:45–4:15 pm
Section on Pain

4:15–6:15 pm
Case-based Discussion Session—Management of Trigeminal Neuralgia

TU OCT 10

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

2:45–4:15 pm
Section on Pain

4:15–6:15 pm
Case-based Discussion Session—Revision Spinal Surgery or Neuromodulation

WE OCT 11

12:15–1:45 pm
Luncheon Seminar
W32 SCS-evidence and Expertise

SUBSPECIALTY SESSION HIGHLIGHTS

PE = PEDIATRIC

MO
OCT 9

12:15–1:45 pm
Luncheon Seminar
M04 Starting a Fetal Myelomeningocele Surgery Program

2:45–4:15 pm
Section on Pediatric Neurological Surgery

4:15–6:15 pm
Case-based Discussion Session—Incidental Discoveries on Pediatric Neuroimaging

TU
OCT 10

12:15–1:45 pm
Luncheon Seminar
T18 Tethered Cord: Practice Variations and Evidence Update

2:45–4:15 pm
Section on Pediatric Neurological Surgery

4:15–6:15 pm
Case-based Discussion Session—Management in Pediatric Athletes

WE
OCT 11

12:15–1:45 pm
Luncheon Seminar
W33 Pediatric Head Trauma

Map out your meeting with this subspecialty-specific guide.

SP = SPINE AND PERIPHERAL NERVES

SA OCT 7

8:00–11:30 am
PC04 Minimally Invasive Spine Surgery—Case-based Complications and Future Directions

12:30–4:00 pm
PC07 Spinal Deformity: Thoracolumbar and Cervical—Case-based Presentations
PC11 Peripheral Nerve Surgery: Techniques and Exposure
PC12 Cervical Spine Case Management: A Case-based Approach to Treating Degenerative and Traumatic Cervical Pathology

SU OCT 8

8:00–11:30 am
PC17 Innovation in Spine Surgery: From Artificial Discs to Biologics, Robots, and Advanced Navigation
PC21 Spinal Trauma: Case-based Presentations and Guidelines Update

12:30–4:00 pm
PC24 Spinal Biomechanics in Modern Clinical Practice
PC25 Thoracolumbar: Trauma, Tumor, and Degenerative—Case-based Presentations

MO OCT 9

7:00–8:30 am
Guidelines on Spine Update

12:15–1:45 pm
Luncheon Seminars
M05 Peripheral Nerve Entrapment Syndromes: Diagnosis and Management
M06 Spinal Column Metastases Management
M07 Navigation in Spine Surgery: Robotics—The Future is Now

2:45–4:15 pm
Section on Disorders of the Spine and Peripheral Nerves

4:15–6:15 pm
Case-based Discussion Session—Cervical Trauma

7:30–9:30 pm
Dinner Seminar
DIN2 Frontiers in Spine Surgery: Artificial Discs, Robotics/Navigation, Spinal Endoscopy, and Minimally Invasive Surgery

TU OCT 10

12:15–1:45 pm
Luncheon Seminars
T19 Controversies in Spinal Deformity Surgery
T20 Cervical Radiculopathy: Anterior Versus Posterior Approaches
T21 Spinal Surgery Controversies: Case-based Interactive Discussion

2:45–4:15 PM
Section on Disorders of the Spine and Peripheral Nerves

4:15–6:15 pm
Case-based Discussion Session—Adult Degenerative and Deformity
Case-based Discussion Session—Thoracolumbar Spine

WE OCT 11

12:15–1:45 pm
Luncheon Seminar
W34 Complication Management in Spine Surgery

SUBSPECIALTY SESSION HIGHLIGHTS

SF = STEREOTACTIC AND FUNCTIONAL

SA OCT 7

8:00 am–5:00 pm
SYM1 Functional Neurosurgery Update

SU OCT 8

12:30–4:00 pm
PC28 Integrating New Technology Into Your Work Flow: LITT, RNS, Stereo EEG, and Surgical Robots
PC33 Laser Ablation Surgery: Opportunities, Indications, Technique, and Outcome

MO OCT 9

12:15–1:45 pm
Luncheon Seminars
MO8 Minimally Invasive Epilepsy Surgery
MO9 Clinical Trials Review of Key Stereotactic and Functional Studies: Update on the Clinical Translation

2:45–4:15 pm
Section on Stereotactic and Functional Neurosurgery

4:15–6:15 pm
Case-based Discussion Session—Epilepsy

TU OCT 10

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

2:45–4:15 pm
Section on Stereotactic and Functional Neurosurgery

4:15–6:15 pm
Case-based Discussion Session—Stereotactic and Functional

Map out your meeting with this subspecialty-specific guide.

TU = TUMOR

SA OCT 7

8:00–11:30 am
PC01 Comprehensive Endoscopic Skull Base Surgery: Hands-on Cadaver Course Part 1
PC05 Surgical Management of Eloquent Area Tumors: Functional Mapping and/or Navigation
PC06 Contemporary Management of Meningiomas

12:30–4:00 pm
PC08 Management of Pituitary Adenomas and Other Sellar Pathology

SU OCT 8

8:00 am–4:00 pm
PC14 Comprehensive Endoscopic Skull Base Surgery: Hands-on Cadaver Course Part 2

8:00–11:30 am
PC18 Brain Tumor Update Part 1: Malignant Brain Tumors
PC19 3D Surgical Neuroanatomy (Supratentorial)

12:30–4:00 pm
PC26 3D Surgical Neuroanatomy (Infratentorial)
PC27 Brain Tumor Update Part 2: Benign Brain Tumors
PC31 Management of Challenging Brain Tumors

MO OCT 9

7:00–8:30 am
Guidelines of Brain Tumors Update

12:15–1:45 pm
Luncheon Seminars
M11 Update on Diagnosis and Management of Low-grade Gliomas
M12 Immunotherapy-based Therapies for Gliomas and Brain Metastasis

2:45–4:15 pm
Section on Tumors

4:15–6:15 pm
Case-based Discussion Session—Pituitary Tumors

7:30–9:30 pm
Dinner Seminar
DIN3 Skull Base Tumors: Contemporary Management

TU OCT 10

12:15–1:45 pm
Luncheon Seminars
T16 ICH Trial Update
T23 Malignant Gliomas: Advances in Surgery and Adjuvant Therapy
T25 Meningioma: Management Strategies
T26 Laser Interstitial Thermal Therapy for Brain Tumors

2:45–4:15 pm
Section on Tumors

4:15–6:15 pm
Case-based Discussion Session—Brain Metastasis

WE OCT 11

12:15–1:45 pm
Luncheon Seminars
W31 Intra-arterial Therapies for Tumors
W35 Non-functioning Pituitary Adenomas: Operative Nuances and Management
W36 Cutting-edge Management of Brain Metastasis
W37 Acoustic Neuromas: Current Management Strategies

RESIDENT SESSION HIGHLIGHTS

RE = RESIDENT

SA OCT 7

12:30–4:00 pm

PC11 Peripheral Nerve Surgery: Techniques and Exposure
PC12 Cervical Spine Case Management: A Case-based Approach to Treating Degenerative and Traumatic Cervical Pathology

MO OCT 9

12:15–1:45 pm

Luncheon Seminars

M01 Honored Guest Luncheon: The Art of the Talk
M02 7 Aneurysms
M07 Navigation in Spine Surgery: Robotics—The Future is Now
M09 Clinical Trials Review of Key Stereotactic and Functional Studies: Update on the Clinical Translation
M11 Update on Diagnosis and Management of Low-grade Gliomas
M13 Making Sense of MACRA

2:45–3:27 pm

Council of the State Neurosurgical Societies: Being Hospital-employed

4:15–6:15 pm

Case-based Discussion Sessions

WE OCT 11

12:15–1:45 pm

Luncheon Seminars

W34 Complication Management in Spine Surgery
W36 Cutting-edge Management of Brain Metastasis
W38 From Residency to Practice and Beyond: Getting the Job that is Right for You
W39 Surgery, Research, and Innovation: Lessons Learned from my Mentor

2:45–4:15 pm

SYM4 Big Data

SU OCT 8

8:00–11:30 am

PC03 Thrombectomy Tips and Tricks
PC19 3D Surgical Neuroanatomy (Supratentorial)
PC20 Neurosurgeon-hospital Relationships: Options, Negotiations, and Achieving What You Are Worth
PC21 Spinal Trauma: Case-based Presentations and Guidelines Update

12:30–4:00 pm

PC23 What You Need to Know When Looking for Your First (or Maybe Second) Job
PC26 3D Surgical Neuroanatomy (Infratentorial)
PC32 Clinical Guidelines Development: A Primer on the Development and Review of Evidence-based Clinical Guidelines

TU OCT 10

Luncheon Seminars

12:15–1:45 pm

T16 ICH Trial Update
T22 Building a Functional Neurosurgery Practice
T26 Laser Interstitial Thermal Therapy for Brain Tumors

3:27–4:15 pm

Council of the State Neurosurgical Societies: Surviving Health System Consolidation for the Hospital Employed and the Independent Neurosurgeon

4:15–6:15 pm

Case-based Discussion Sessions

APP SESSION HIGHLIGHTS

AP = ADVANCED PRACTICE PROVIDER

SA OCT 7

8:00–11:30 am

PC04 Minimally Invasive Spine Surgery—Case-based Complications and Future Directions

12:30–4:00 pm

PC07 Spinal Deformity: Thoracolumbar and Cervical—Case-based Presentations

PC12 Cervical Spine Case Management: A Case-based Approach to Treating Degenerative and Traumatic Cervical Pathology

SU OCT 8

8:00 am–4:00 pm

PC15 ANSPA Annual Fall CME Meeting: Presented in Collaboration with the CNS

8:00–11:30 am

PC18 Brain Tumor Update Part 1: Malignant Brain Tumors

12:30–4:00 pm

PC22 Economics of Neurosurgery: Navigating MACRA/MIPS, Bundled Payments, and Future of Health Care Across Practice Settings

PC25 Thoracolumbar: Trauma, Tumor, and Degenerative—Case-based Presentations

PC29 Neurosurgical Treatment of Chronic Headache

PC32 Clinical Guidelines Development: A Primer on the Development and Review of Evidence-based Clinical Guidelines

MO OCT 9

12:15–1:45 pm

Luncheon Seminars

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

M10 Diagnosis and Management of Low-grade Gliomas

M13 Making Sense of MACRA

TU OCT 10

12:15–1:45 pm

Luncheon Seminars

T24 Managing ICP in the Trauma Patient

T25 Meningioma: Management Strategies

WE OCT 11

12:15–1:45 pm

Luncheon Seminars

W33 Pediatric Head Trauma

W37 Acoustic Neuromas: Current Management Strategies

2:45–4:15 pm

SYM4 Big Data

GENERAL SESSION HIGHLIGHTS

GE = GENERAL

SU OCT 8

8:00 am–4:00 pm
PC16 SANS MOC Course

8:00–11:30 am
PC20 Neurosurgeon-hospital Relationships: Options, Negotiations, and Achieving What You Are Worth

12:30–4:00 pm
PC23 What You Need to Know When Looking for Your First (or Maybe Second) Job
PC30 Clinical Trials 101: What Neurosurgeons Should Know
PC32 Clinical Guidelines Development: A Primer on the Development and Review of Evidence-based Clinical Guidelines

4:30–6:30 pm
General Scientific Session I

MO OCT 9

8:45 am–12:15 pm
General Scientific Session II

12:15–1:45 pm
Luncheon Seminar
M14 Educating Neurosurgeons: The Science and Art of Teaching Surgery

TU OCT 10

7:00–8:30 am
Rapid-exchange Oral Presentations 1
Late-breaking Abstracts

8:45 am–12:15 pm
General Scientific Session III

7:30–9:30 PM
Dinner Seminar
DIN4 Global Neurosurgery

WE OCT 11

7:00–8:30 am
Rapid-exchange Oral Presentations 2
Rapid-exchange Oral Presentations 3

8:45 am–12:15 pm
General Scientific Session IV

12:15–1:45 PM
Luncheon Seminars
W28 How to Onboard New Partners
W38 From Residency to Practice and Beyond: Getting the Job that is Right for You
W39 Surgery, Research, and Innovation: Lessons Learned from my Mentor

2:45–4:15 pm
SYM4 Big Data

SOCIOECONOMIC SESSION HIGHLIGHTS

SE = SOCIOECONOMIC

SA OCT 7

6:30–8:30 pm

DIN1 The World is Changing Around Us—New CPT Codes, ICD-10, MIPS, and Bundling: Does This Affect My Bottom Line?

SU OCT 8

8:00–11:30 am

PC20 Neurosurgeon-hospital Relationships: Options, Negotiations, and Achieving What You Are Worth

12:30–4:00 pm

PC22 Economics of Neurosurgery: Navigating MACRA/MIPS, Bundled Payments, and Future of Health Care Across Practice Settings

PC23 What You Need to Know When Looking for Your First (or Maybe Second) Job

MO OCT 9

12:15–1:45 pm

Luncheon Seminar

M13 Making Sense of MACRA

2:45–4:15 pm

Council of State Neurosurgical Societies

TU OCT 10

12:15–1:45 pm

Luncheon Seminar

T27 Using Outcome Data to Work with Hospital Administration on Appropriate Quality Metrics

SA OCT 7

PROGRAM HIGHLIGHTS

8:00 AM–5:00 PM

SYMPOSIUM 1

Functional Neurosurgery Update

8:00 AM–4:00 PM

PRACTICAL COURSE 01

Comprehensive Endoscopic Skull Base Surgery: Hands-on Cadaver Course Part 1

6:30-8:30 PM

DINNER SEMINAR 1

The World is Changing Around Us: New CPT Codes, ICD-10, MIPS, and Bundling: Does This Affect My Bottom Line?

Cinquecento Roman Trattoria

5:00–6:30 pm

INTERNATIONAL RECEPTION

Westin Boston Waterfront

Join colleagues from every corner of the world at the 2017 International Reception. Take in the beautiful Boston waterfront while enjoying hors d'oeuvres, cocktails, and conversation. All international attendees and their registered guests are invited to attend.

*International attendees are considered those who live outside the US, Canada, and Mexico.

SYMPOSIUM 1

SANS ANNUAL MEETING *SANS supplemental exam is available for an additional $15.*

PA SF 8:00 am–5:00 pm Fee: $300

SYM1 Functional Neurosurgery Update

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

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

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

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

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

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

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

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

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

8:45–9:00 am
Panel Discussion

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

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

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

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

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

10:15–10:30 am
Panel Discussion

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

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

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

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

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

11:45 am–12:00 pm
Panel Discussion

12:00–1:00 pm
Lunch

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4:45–5:00 pm
Panel Discussion

PRACTICAL COURSES

TU 8:00 am–4:00 pm

Part 1: Didactic and Lab $1,600
Parts 1 & 2: Didactic and Lab* $3,000

Part 1: Didactic Only $550
Parts 1 & 2: Didactic Only* $1000

PC01 Comprehensive Endoscopic Skull Base Surgery: Hands-on Cadaver Course Part 1

COURSE DIRECTORS: James J. Evans, Daniel M. Prevedello
FACULTY: William T. Couldwell, Chandrashekhar Deopujari, Amin B. Kassam, Daniel F. Kelly, James K. Liu, Vedantam Rajshekhar, Kristen O. Riley, Harry R. van Loveren
COURSE DESCRIPTION: This course is designed to allow both novice and experienced surgeons to enhance their knowledge and hands-on skill with endoscopic endonasal surgical techniques. National and international leaders in the field will teach by didactic presentations, case discussions, prosections, and by guiding participants through cadaveric dissection. Particular emphasis will be placed on comparing open and endoscopic approaches to particular cranial base targets.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the indications and limitations of endonasal management of cranial base tumors.
- Discuss methods of complication avoidance during endonasal surgery.
- Compare and contrast the merits of open and endoscopic approaches to similar cranial base targets.
- Apply endoscopic surgical techniques in their own practice and develop increased competence through use of hands-on cadaveric prosections.

*See page 34 for Part 2: PC14

CV 8:00–11:30 am Fee: $450

PC02 Advanced Cerebrovascular Surgery: 2D and 3D Operative Video-based Surgical and Anatomical Pearls

COURSE DIRECTOR: Peter Nakaji
FACULTY: Nicholas C. Bambakidis, Daniel L. Barrow, Giovanni Broggi, Arthur L. Day, Michael T. Lawton
COURSE DESCRIPTION: This course will employ a dynamic senior faculty using high-quality video content to illustrate important points in the management of open cerebrovascular pathologies, including aneurysms, AVMs, cavernous malformations, fistulae, and bypass. The course will highlight difficult cases and special challenges such as the management of intraoperative rupture of aneurysms and the management of unexpected complications.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe a systematic approach to basic and complicated aneurysms that achieves clipping and reconstruction.
- Select approaches to aneurysms in different locations, including minimally invasive approaches.
- Employ strategies to manage intraoperative complications, including intraoperative aneurysm rupture.
- Plan approaches that include multimodality therapy with endovascular therapy.
- Apply these technical lessons in their own surgical management of vascular lesions.

CV RE 8:00–11:30 am Fee: $450

PC03 Thrombectomy Tips and Tricks

COURSE DIRECTOR: David M. Hasan
FACULTY: Ketan R. Bulsara, Aaron S. Dumont, Kyle Fargen, Brian L. Hoh, Scott D. Simon, Michelle J. Smith
COURSE DESCRIPTION: As thrombectomy for acute stroke has become an accepted therapy, the tools available to neurosurgeons have proliferated. Participants will discuss concepts, challenging cases, and novel combinations of devices to maximize results. There will also be opportunity to practice on vascular simulators.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Define what preoperative imaging tools and protocols can identify patients likely to benefit in a timely fashion.
- List the available technology for performing thrombectomy.
- Explain methods to maximize recanalization rates.

AP SP 8:00–11:30 am Fee: $450

PC04 Minimally Invasive Spine Surgery—Case-based Complications and Future Directions

COURSE DIRECTORS: Adam S. Kanter, Praveen V. Mummaneni
FACULTY: Aaron J. Clark, Sudhir Dubey, Kevin T. Foley, Langston T. Holly, Wilson Z. Ray, Bhawani S. Sharma, Khoi Duc Than
COURSE DESCRIPTION: This course will discuss state-of-the-art, minimally invasive techniques, and how past complications have led to current trends and future directions.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify appropriate indications for minimally invasive surgery.
- Distinguish which patients may benefit from minimally invasive techniques.
- Avoid common complications associated with minimally invasive surgery.

TU 8:00–11:30 am Fee: $450

PC05 Surgical Management of Eloquent Area Tumors: Functional Mapping and/or Navigation

COURSE DIRECTORS: Mitchel S. Berger, Shawn L. Hervey-Jumper
FACULTY: Hugues Duffau, Jason Heth, Maryam Rahman, George Samandouras
COURSE DESCRIPTION: This course will outline in detail the management strategies for removing tumors in eloquent or functional areas by utilizing the functional brain mapping technique.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Explain decision-making for surgical management of tumors in eloquent regions.
- Discuss the use of functional mapping and imaging for removing functional area tumors.
- Identify the use of functional mapping to facilitate extent of resection and outcome for brain tumors in functional regions.

TU 8:00–11:30 am Fee: $450

PC06 Contemporary Management of Meningiomas

COURSE DIRECTORS: Frederick G. Barker, Atul H. Goel
FACULTY: Bob S. Carter, Douglas Kondziolka, Suresh Nair, Charles Teo
COURSE DESCRIPTION: This course will feature leading surgeons in the field of meningioma surgery, who will discuss the current and

emerging strategies for patients with meningiomas. Participants should expect to finish the course with a current understanding of standard and emerging treatment strategies available to neurosurgeons for the treatment of patients with meningiomas.

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

- Explain current guidelines related to management of meningiomas in setting of gross-total and sub-total resection.
- Identify risk factors for meningioma progression.
- Apply existing evidence for adjuvant radiation, chemotherapy, and targeted therapy in the management of meningiomas.
- Apply existing data to counseling patients with asymptomatic or atypical meningiomas.

AP SP 12:30–4:00 pm Fee: $450

PC07 Spinal Deformity: Thoracolumbar and Cervical—Case-based Presentations

COURSE DIRECTOR: Christopher I. Shaffrey

FACULTY: Ian G. Dorward, Daniel R. Fassett, D. Kojo Hamilton, Paul K. Kim, Frank La Marca, Praveen V. Mummaneni, Justin S. Smith, Lee A. Tan

COURSE DESCRIPTION: This course will use case-based learning to describe the diagnosis and treatment of thoracolumbar and cervical adult deformity including pearls for complication avoidance.

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

- Determine which patients would benefit from anterior versus posterior versus combined approaches.
- Describe common complications associated with anterior and posterior cervical spine approaches.
- Identify complex cervical spinal pathologies and associated surgical techniques to treat them.

TU 12:30–4:00 pm Fee: $450

PC08 Management of Pituitary Adenomas and Other Sellar Pathology

COURSE DIRECTORS: Edward R. Laws, Zachary N. Litvack, Gelareh Zadeh

FACULTY: Deepu Banerji, Daniel F. Kelly, John S. Kuo, Andrew S. Little, Edward H. Oldfield, Chirag G. Patil, Steven N. Roper, Michael E. Sughrue

COURSE DESCRIPTION: This course will feature leading surgeons in the field of pituitary surgery, who will discuss the anatomy of the parasellar region as well as microscopic, 2D, and 3D endoscopic techniques. The indications for extended approaches as well as transcranial techniques will be discussed. Complication avoidance, skull base repair, and indications for radiosurgery will also be emphasized. Lastly, faculty will discuss the indications for and outcomes after radiosurgery of pituitary adenomas.

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

- Describe the relevant surgical anatomy for the transsphenoidal technique.
- Outline the current surgical techniques and nuances for the resection of pituitary adenomas.
- Describe the indications for extended transsphenoidal and transcranial approaches for pituitary adenomas.
- Explain the indications for radiosurgery and complication avoidance in pituitary surgery and apply these principles in their own patient selection and surgical management of patients requiring pituitary surgery.

CV 12:30–4:00 pm Fee: $450

PC09 New Devices and Technology in Cerebrovascular Neurosurgery (Includes Aneurysm Treatment, ICH, Stroke)

COURSE DIRECTOR: Pascal Jabbour

FACULTY: Mark D. Bain, Brian T. Jankowitz, Adam J. Polifka, Henry H. Woo

COURSE DESCRIPTION: This course will give an update on all the new and upcoming devices for neurointerventional surgeons.

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

- Identify new endovascular technology for the treatment of cerebral aneurysms.
- Discuss operative indications and techniques for utilization of new cerebrovascular neurosurgical technology.
- Compare and contrast new technology and relate this to existing equipment and technology.
- Identify limitations of new cerebrovascular neurosurgical technology.

CV 12:30–4:00 pm Fee: $450

PC10 Complications in Cerebrovascular Neurosurgery

COURSE DIRECTOR: Stavropoula I. Tjoumakaris

FACULTY: Ketan R. Bulsara, Sean D. Lavine, William J. Mack, Christopher S. Ogilvy, Robert H. Rosenwasser

COURSE DESCRIPTION: An open discussion about challenging cases and complications in cerebrovascular cases. The participants will have the opportunity to discuss prevention, and intraoperative and postoperative management of vascular complications.

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

- Identify cerebrovascular complications in both open and endovascular neurosurgery.
- Discuss methods to help with preparation for and prevention of complications associated with cerebrovascular neurosurgery.
- Describe management of acute scenarios in cerebrovascular neurosurgery.

RE SP 12:30–4:00 pm Fee: $450

PC11 Peripheral Nerve Surgery: Techniques and Exposure

COURSE DIRECTORS: Rajiv Midha, Robert J. Spinner

FACULTY: Holly Gilmer, Amgad S. Hanna, Marie-Noelle Hebert-Blouin, Line G. Jacques, Mark A. Mahan, Elias B. Rizk, Thomas J. Wilson, Lynda Jun-San Yang, Eric L. Zager

COURSE DESCRIPTION: Using a combination of didactic lectures, case-based discussion, and prosection demonstration, the faculty will provide learners with fundamental knowledge in peripheral nerve evaluation, surgical exposure, and management of common surgical nerve conditions.

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

- Describe surgical exposures and techniques for common peripheral nerve pathologies.
- Determine appropriate diagnostic workup and diagnosis of patients with peripheral nerve entrapment.
- Identify and avoid common complications associated with peripheral nerve surgery.

PRACTICAL COURSES

AP RE SP 12:30–4:00 pm Fee: $450

PC12 Cervical Spine Case Management: A Case-based Approach to Treating Degenerative and Traumatic Cervical Pathology

COURSE DIRECTORS: Andrew T. Dailey, Michael G. Kaiser
FACULTY: Sanjay Behari, Kurt M. Eichholz, Daniel J. Hoh, R. John Hurlbert, Srinivas K. Prasad
COURSE DESCRIPTION: This course will be comprised of case-based discussions of modern anterior/posterior/combined techniques to treat common cervical spine pathologies, both degenerative and traumatic.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss techniques and approaches to treat adult deformity.
- Determine appropriate indications and treatment pathways for adult deformity patients.
- Identify and avoid common complications associated with thoracolumbar and cervical deformity.

TR 12:30–4:00 pm Fee: $450

PC13 Sports Concussions: Acute Management, Return to Activity and Possible Short- and Long-term Sequelae

COURSE DIRECTORS: Domenic Esposito, David Okonkwo
FACULTY: Robert Cantu, Ann McKee, Allen Sills, Philip Stieg, Shelly Timmons
COURSE DESCRIPTION: This course is designed to allow the practicing neurosurgeon as well as the neurotraumatologist to review older as well as more recent definitions and concepts of the concussed athlete. Attention will be paid to the common as well as less common activities associated with these injuries. Classic and more recent concepts for the return to limited and full activities following one or more concussive or sub-concussive episodes will be presented. The extensive Boston University Brain experience will be presented by the investigators from both a pathological as well as clinical perspective. The spectrum of disorders from transient and resolving, to more persistent and refractory as well as delayed long term diseases thought to be related to repetitive injury, will be critically analyzed. Multiple neurosurgeons with extensive clinical experience ranging from youth athletics to the professional athlete will share their experience and recommendations. The basic necessities for the development of a "Concussion Center" will be discussed. Finally, standard approaches as well as novel and experimental treatment options for the clinical care of these patients will be outlined.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- To review the mechanisms, pathophysiology, and acute management of sports concussions.
- To understand the timing and conditions for return to limited and full activities following one or more concussions.
- To understand the possible short and long term consequences of single and multiple concussive and sub-concussive injuries as well as standard and novel treatment modalities for these conditions.

DINNER SEMINAR 1

Complimentary shuttle service will be provided for all dinner seminars. Shuttles will depart from the Westin Boston Waterfront Hotel.

SA OCT 7

SE 6:30–8:30 pm Fee: $190 (includes three-course dinner and beverage)

DIN1 The World is Changing Around Us—New CPT Codes, ICD-10, MIPS, and Bundling: Does This Affect My Bottom Line?

MODERATORS: John K. Ratliff, Henry H. Woo
FACULTY: Clemens M. Schirmer, Philip W. Tally, Luis M. Tumialan
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss the basics of CPT coding and how various codes are selected for specific cases.
- Summarize the update on new CPT codes recently passed for 2017.
- Implement these coding changes in their own practices to insure accuracy and reimbursement.
- Discuss the impact of MACRA/MIPS and the new Quality Payment Program.
- Appreciate the potential impact of bundled payments.
- Discuss the impact of ICD-10 implementation.
- Apply these lessons to the implementation of ICD-10 in their own practices.

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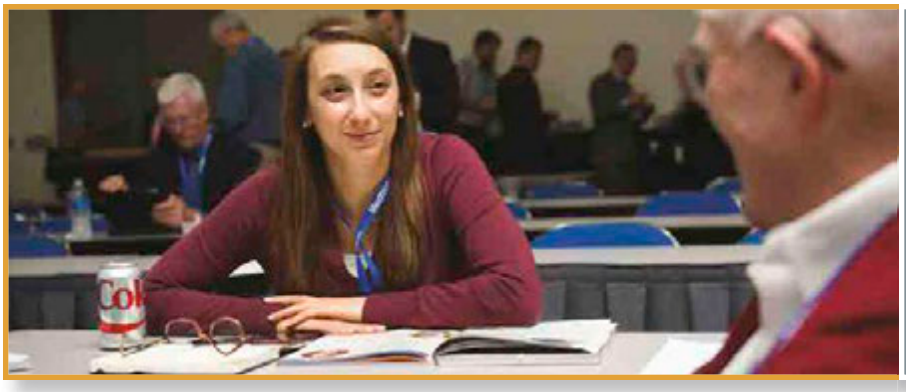
SU OCT 8

PROGRAM HIGHLIGHTS



8:00 AM–4:00 PM

SYMPOSIUM 2

Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon

8:00 AM–4:00 PM

SYMPOSIUM 3

Neurocritical Care and Neurosurgical Emergencies Update

4:52–5:12 PM

SPECIAL LECTURE

The Future of the Professions

Richard Susskind

5:15–5:45 PM

SPECIAL LECTURE

The Need for Closure in the Workplace: How Handling Ambiguity Well Improves Decision-making, Creativity, and Empathy

Jamie Holmes

6:30–8:30 PM

OPENING RECEPTION

Boston Convention & Exhibition Center

SYMPOSIUM 2

CV 8:00 am–4:00 pm Fee: $300

SYM2 Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon

COURSE DIRECTORS: Peter Kan, Adnan H. Siddiqui
SPEAKERS: Sepideh Amin-Hanjani, Adam S. Arthur, Mark D. Bain, Ricardo A. Hanel, Robert E. Harbaugh, Brian L. Hoh, Peter Kan, Elad I. Levy, Eng Lo, Demetrius K. Lopes, Michael W. McDermott, J D. Mocco, Jacques J. Morcos, Christopher S. Ogilvy, Adnan H. Siddiqui, Edward R. Smith, Kenneth V. Snyder, Gary K. Steinberg, Babu G. Welch, Henry H. Woo
COURSE DESCRIPTION: This symposium provides a forum for attendees to obtain the latest information about current therapy for acute ischemic stroke. We will review current literature regarding patient selection for endovascular stroke therapy and discuss the current practice on endovascular and surgical revascularization for extracranial atherosclerotic diseases. The course will also cover optimal treatment of intracranial aneurysms, including new technologies and the optimal treatment options of intracranial vascular malformations and intracerebral hemorrhage.
LEARNING OBJECTIVES: *Upon the completion of this course, participants will be able to:*

- Outline recent literature regarding the use of endovascular therapy for acute ischemic stroke.
- Describe recent literature on endovascular and surgical revascularization (CAS versus CEA) for extracranial atherosclerotic carotid disease.
- Select the optimal treatment of intracranial aneurysms using surgery and endovascular techniques.
- Identify the optimal treatment options of intracranial arteriovenous malformations.
- Review evidence-based guidelines in the treatment of intracerebral hemorrhage.

8:00–8:10 am
Welcome
Peter Kan

8:15–9:00 am
Didactic Session 1: Acute Ischemic Stroke Intervention—An Update

8:15–8:30 am
Who Should We Select for Endovascular Stroke Therapy: State-of-the-art Evidence
J D. Mocco

8:30–8:45 am
Advanced Imaging for Patient Selection for Stroke Intervention
Kenneth V. Snyder

8:45–9:00 am
Where Should We Select Patients for Endovascular Stroke Therapy? Mobile Stroke Unit, Emergency Room, or the Angio Suite?
Adam S. Arthur

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

9:30–9:45 am
Neuroprotective Strategies in Acute Ischemic Stroke
Eng Lo

9:45–10:00 am
Stem Cell Therapy in the Treatment of Acute Ischemic Stroke
Gary K. Steinberg

10:00–10:15 am
Endovascular Management of Venous Sinus Thrombosis
Babu G. Welch

10:15–10:45 am
Morning Breakout Session with Corporate Sponsor

10:45–11:15 am
Didactic Session 2: Management of Intracranial Atherosclerotic and Vaso-occlusive Disease—An Update

10:45–11:00 am
EC-IC Bypass for Moya Moya Disease
Edward R. Smith

11:00–11:15 am
Defining Flow Criteria for Intracranial Vaso-occlusive Disease
Sepideh Amin-Hanjani

11:15–12:00 pm
Didactic Session 3: Management of Extracranial Atherosclerotic and Vaso-occlusive Disease—An Update

11:15–11:30 am
CAS for Extracranial Atherosclerotic Disease
Elad I. Levy

11:30–11:45 am
CEA for Extracranial Atherosclerotic Disease
Robert E. Harbaugh

11:45–12:00 pm
Management for Vertebral Origin Disease
Henry H. Woo

12:00–12:45 pm
Afternoon Breakout Session with Corporate Sponsor and Lunch

12:45–1:45 pm
Didactic Session 4: Optimal Treatment of Intracranial Aneurysms—An Update

12:45–1:00 pm
Unruptured Aneurysms: Who to Treat?
Christopher S. Ogilvy

1:00–1:15 pm
Primary or Adjunctive Coiling of Intracranial Aneurysms in the Era of Expanding Technology
Brian L. Hoh

1:15–1:30 pm
Bypass for Intracranial Aneurysms in the Era of Flow Diversion
Jacques J. Morcos

1:30–1:45 pm
Management of Vasospasm: An Update
Sepideh Amin-Hanjani

1:45–2:15 pm
Didactic Session 5: New Technologies for Interventional Treatment of Intracranial Aneurysms—An Update

1:45–1:55 pm
Flow Diversion
Peter Kan

1:55–2:05 pm
Endovascular Devices
Ricardo A. Hanel

2:05–2:15 pm
Novel Stents
Demetrius K. Lopes

2:15–2:45 pm
Afternoon Breakout Session with Corporate Sponsor

2:45–3:30 pm
Didactic Session 6: Management of Arteriovenous Malformations—An Update

2:45–3:00 pm
Surgical Treatment
Sepideh Amin-Hanjani

3:00–3:15 pm
Endovascular Treatment
Adnan H. Siddiqui

3:15–3:30 pm
Radiosurgical Treatment
Michael W. McDermott

3:30–3:45 pm
Didactic Session 7: Management of ICH—An Update

3:30–3:45 pm
Surgical Management of ICH: Latest Evidence and Devices
Mark D. Bain

3:45–4:00 pm
Questions and Discussion

SYMPOSIUM 3

TR 8:00 am–4:00 pm Fee: $300

SYM3 Neurocritical Care and Neurosurgical Emergencies Update

COURSE DIRECTORS: Kathryn M. Beauchamp, Jamie S. Ullman

SPEAKERS: Kathryn M. Beauchamp, Alia Hdeib, Alan S. Hoffer, Patricia B. Raksin, Joshua E. Medow, Ramesh C. Mishra, Gregory J. Murad, Craig H. Rabb, Gary T. Schwartzbauer, Eve C. Tsai, Jamie S. Ullman

COURSE DESCRIPTION: This symposium provides a forum for attendees to obtain the latest information about current management of neurosurgical emergencies and common neurocritical care scenarios. Management of brain and spine injuries will be discussed as well as issues related to spinal tumor and infections. This symposium features interactive case presentations of common scenarios encountered in an emergency neurosurgical practice.

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

- Review current recommendations for treatment of traumatic brain injury.
- Apply recent literature to the management of spinal infections and spinal tumors.
- Interpret recent clinical trials evaluating surgical decompression for intracranial hypertension.
- Discuss common systemic complications after neurologic injury.

8:00–8:15 am
Introduction
Jamie S. Ullman, Kathryn M. Beauchamp

8:15–9:30 am
Didactic Session 1

8:15–8:30 am
Seizures and Status Epilepticus
Joshua E. Medow

8:30–8:45 am
Intracranial Hypertension
Gregory J. Murad

8:45–9:15 am
Tools of the Trade: Neuromonitoring
Gregory Kapinos

9:15–9:30 am
Discussion of Cases

9:30–10:00 am
Beverage Break with Corporate Sponsor

10:00–11:30 am
Didactic Session 2

10:00–10:15 am
Head Injury in Polytrauma
Patricia B. Raksin

10:15–10:30 am
Pulmonary Complications of Neurological Injuries
Alan S. Hoffer

10:30–11:00 am
On-Call Support Group: Small Group Discussions About On-call Experiences

11:00–11:30 am
Discussion of Cases

11:30 am–12:00 pm
Beverage Break with Corporate Sponsor

12:00–12:45 pm
Lunch

12:45–2:15 pm
Didactic Session 3

12:45–1:00 pm
Prehospital Management of TBI
Gary T. Schwartzbauer

1:00–1:15 pm
Traumatic Intracranial Hemorrhages
Eve C. Tsai

1:15–1:30 pm
Neurotrauma in India
Ramesh C. Mishra

1:45–2:15 pm
Discussion of Cases

2:15–2:45 pm
Beverage Break with Corporate Sponsor

2:45–4:00 pm
Didactic Session 4

2:45–3:00 pm
Spine Trauma
Craig H. Rabb

3:00–3:15 pm
Tumors and Infections of the Spine
Alia Hdeib

3:15–3:45 pm
Tools of the Trade: Spinal Instrumentation—Open and Percutaneous

3:45–4:00 pm
Discussion of Cases

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- ★ Luncheon Seminars (1.5 *AMA PRA Category 1 Credits*™)

PRACTICAL COURSES

TU 8:00 am–4:00 pm

Part 2: Didactic and Lab.....$1,600
Part 2: Didactic Only.....$550

PC14 Comprehensive Endoscopic Skull Base Surgery: Hands-on Cadaver Course Part 2

COURSE DIRECTORS: James J. Evans, Daniel M. Prevedello
FACULTY: Arnau Benet, William T. Couldwell, Chandrashekhar Deopujari, Sebastien Froelich, Vedantam Rajshekhar, Kristen O. Riley, Theodore H. Schwartz, Chandra N. Sen, Sumit Sinha
COURSE DESCRIPTION: This course is designed to allow both novice and experienced surgeons to enhance their knowledge and hands-on skill with endoscopic endonasal surgical techniques. National and international leaders in the field will teach by didactic presentations and by guiding participants through cadaveric dissection. Particular emphasis will be placed on comparing open and endoscopic approaches to particular cranial base targets.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the indications and limitations of endonasal management of cranial base tumors.
- Review methods of complication avoidance during endonasal surgery.
- Compare and contrast the merits of open and endoscopic approaches to similar cranial base targets.
- Apply these surgical techniques in their own practice and develop increased competence through use of hands-on cadaveric prosections.

AP 8:00 am–4:00 pm Fee: $450

PC15 ANSPA Annual Fall CME Meeting: Presented in Collaboration with the CNS

COURSE DIRECTOR: Joshua J. Beardsley
FACULTY: Bianca Belcher, Grace Bryan, Domagoj Coric, Hugh G. Deen, Robert Griffin, Brian L. Hoh, Christopher M. Holland, Alfred Quinones-Hinojosa, Ronald Reimer
COURSE DESCRIPTION: The ANSPA Annual CME Meeting, presented in collaboration with the CNS is created specifically for PAs and NPs working in, or interested in, neurosurgery.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify and discuss treatment options related to neurosurgical pathology.
- Gain an understanding of the work-up required to diagnose and treat patients with neurosurgery related conditions.
- Apply neurosurgical principles in their triage and treatment of patients in their PA/NP practice.

GE 8:00 am–4:00 pm Fee: $450

PC16 SANS MOC Course

COURSE DIRECTORS: Ashok Asthagiri, Nader Pouratian
FACULTY: Geoff Colby, Daniel J. Hoh, Mark Krieger, Geoff Manley
COURSE DESCRIPTION: This review course provides an in-depth, interactive, and thorough review of the neurosurgical specialty using the trusted SANS Lifelong Learning resource.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the surgical and non-surgical management of pain or pathological processes that affect the central nervous system (e.g. brain, hypophysis, and spinal cord), the peripheral nervous system (e.g. cranial, spinal, and peripheral nerves), the autonomic nervous system, the supporting structures of these systems (e.g. meninges, skull and skull base, and vertebral column), and their vascular supply (e.g. intracranial, extracranial, and spinal vasculature).
- Discuss the use and interpretation of imaging associated with these conditions.

SP 8:00–11:30 am Fee: $450

PC17 Innovation in Spine Surgery: From Artificial Discs to Biologics, Robots, and Advanced Navigation

COURSE DIRECTOR: Domagoj Coric
FACULTY: Robert E. Isaacs, Eric W. Nottmeier, Mark E. Shaffrey, Michael P. Steinmetz, Nicholas Theodore, Cheerag D. Upadhyaya
COURSE DESCRIPTION: This course will discuss new spinal technologies and techniques including expandable cages, cervical artificial discs, spinal navigation, and robotics, and how they can be incorporated into clinical practice.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss the evidence basis for novel spinal technologies and techniques.
- Evaluate how new spinal techniques and technologies can be incorporated into your clinical practice.
- Identify the relative strengths and weakness of novel techniques compared to more traditional approaches.

SANS ANNUAL MEETING *SANS supplemental exam is available for an additional $15.*

TU 8:00–11:30 am Fee: $450

PC18 Brain Tumor Update Part 1: Malignant Brain Tumors

COURSE DIRECTORS: Manish K. Aghi, Andrew E. Sloan
FACULTY: Orin Bloch, Isabella M. Germano, Michael Lim, Nader Sanai, Ashish Suri, Jeffrey S. Weinberg
COURSE DESCRIPTION: This course will review standard of care guidelines in the management of malignant brain tumors, followed by a discussion and demonstration of innovative techniques which may become standard of care in the future. Attendees will have an opportunity to view and practice various techniques at vendor-sponsored booths.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Formulate treatment plans for malignant brain tumors, particularly high-grade gliomas, based on evidence-based guidelines.
- Integrate techniques such as intraoperative MRI and 5-ALA fluorescence to improve extent of resection.
- Discuss the role of neuro-monitoring in improving functional outcomes after surgery for gliomas.
- Review basic principles of stereotactic radiosurgery when used to treat malignant tumors.
- Discuss novel, minimally invasive image-guided treatments for malignant brain tumors like laser interstitial thermotherapy (LITT), convention-enhanced delivery (CED), and surgical stimulation.

SUBSPECIALTY SESSION TRACK KEY

- AP = Advanced Practice Provider
- CV = Cerebrovascular
- GE = General
- PA = Pain
- PE = Pediatric
- RE = Resident
- SE = Socioeconomic
- SF = Stereotactic and Functional
- SP = Spine and Peripheral Nerves
- TR = Neurotrauma
- TU = Tumor

TU 8:00–11:30 am Fee: $450

PC19 3D Surgical Neuroanatomy (Supratentorial)

COURSE DIRECTOR: Juan Carlos Fernandez-Miranda
FACULTY: Mustafa K. Baskaya, Aaron A. Cohen-Gadol, Christopher J. Farrell, Amin B. Kassam, Pablo A. Rubino, Jeffrey M. Sorenson, Ugur Ture
COURSE DESCRIPTION: This course will review relevant surgical neuroanatomy using 3D stereoscopic projection. The areas covered will include cortical and white matter anatomy, cerebrovascular, and skull base anatomy. Master surgeons will illustrate the importance of surgical neuroanatomy for clinical practice with surgical cases and HD/3D video illustrations. There will be an emphasis both in intricate anatomical regions such as insular, ventricles, and cavernous sinus, and newest techniques such as high-definition fiber tractography (HDFT) planning for intrinsic tumor surgery and endoscopic endonasal techniques for skull base lesions.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Review the complex anatomy of the fiber tracts and the application of HDFT in clinical practice.
- Identify the key surgical anatomy for accessing the ventricles, basal cisterns, and anterior circulation aneurysms.
- Discuss the different routes through the anterior skull base, middle fossa, and cavernous sinus, including endoscopic endonasal and transcranial approaches.

GE RE SE 8:00–11:30 am Fee: $450

PC20 Neurosurgeon-hospital Relationships: Options, Negotiations, and Achieving What You Are Worth

COURSE DIRECTORS: Dong H. Kim, Ann R. Stroink
FACULTY: Deborah L. Benzil, Robert E. Harbaugh, Mitesh V. Shah, Robert J. Weil, Edie E. Zusman
COURSE DESCRIPTION: This course will cover the major changes occurring in the US healthcare system, and the resulting effects on neurosurgical practice. Demographic trends will be reviewed, from increasing employment by hospitals to the rise of new entities like Accountable Care Organizations. A trainee looking for a job, or an established surgeon looking at new opportunities or different relationships to local institutions, will be able to understand the options available and factors relevant to a successful negotiation. How do hospitals and other institutions value neurosurgeons currently, and how might that change? What is the legal basis for such relationships, which define what is and is not possible? What makes an opportunity attractive now, and how can one determine viability in the future? This course will review macro-level changes coupled with faculty that can provide concrete examples, from real-world experience, of individuals and groups that conducted successful negotiations and established new working relationships.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe what major changes will affect US health care, and alter the demographics of neurosurgical practice.
- Describe what laws regulate physician-hospital relationships, and what options are available to neurosurgeons contemplating. employment, joint ventures, or other types of affiliation.
- Describe what gives a neurosurgeon value, and what negotiating strategies are most likely to produce favorable outcomes.
- Learn of different hospital relationships negotiated by other surgeons or groups, and advantages or disadvantages of each approach.
- Recognize the changing environment of neurosurgical practice and engage their local environment to improve service line performance and patient care.

SANS ANNUAL MEETING *SANS supplemental exam is available for an additional $15.*

AP RE SP TR 8:00–11:30 am Fee: $450

PC21 Spinal Trauma: Case-based Presentations and Guidelines Update

COURSE DIRECTOR: Michael G. Fehlings
FACULTY: Bizhan Aarabi, Andrew T. Dailey, Sanjay S. Dhall, James S. Harrop, Daniel J. Hoh, Paul K. Kim, Allan D. Levi, Patrick R. Pritchard
COURSE DESCRIPTION: Use case-based learning to describe the diagnosis and treatment of cervical, thoracic, and lumbar trauma and spinal cord injury.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss techniques and approaches to treat spinal trauma.
- Discuss guidelines for spinal trauma and spinal cord injury treatment.
- Identify and avoid common complications associated with thoracolumbar and cervical deformity.

AP SE 12:30–4:00 pm Fee: $450

PC22 Economics of Neurosurgery: Navigating MACRA/MIPS, Bundled Payments, and Future of Health Care Across Practice Settings

COURSE DIRECTORS: John K. Ratliff, Clemens M. Schirmer
FACULTY: Sandi Lam, Matthew J. McGirt, Katie O. Orrico, Ann R. Stroink, Todd D. Vogel, Rishi K. Wadhwa, John A. Wilson
COURSE DESCRIPTION: This course details the changes introduced by the Medicare Access and CHIP Reauthorization Act (MACRA), which repealed Medicare's sustainable growth rate (SGR) formula and replaced it with a new payment system with two paths—the Merit-based Incentive Payment System (MIPS) and the Advanced Alternative Payment Models (APMs). The new program consolidates components of three existing Medicare penalty programs—Physician Quality Reporting System (PQRS), Electronic Health Record (EHR), and Value-Based Payment Modifier (VM)—and creates an opportunity for neurosurgeons to earn quality improvement bonus payments. Discuss how the changing health care delivery system impacts spine surgery and surgeons including the delivery of evidence-based quality care, the rise of ambulatory spine surgery and how to create a "spine bundle" payment model.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the components of the MACRA legislation pertinent to neurosurgeons.
- Identify the choices involved when choosing one of the different programs.
- Share this information with their practices and implement their optimal choice going forward.
- Evaluate the role of data collection and spine registries in the delivery of evidence-based spine surgery.
- Choose how to create and implement a "spine bundle" into clinical practice.
- Identify spine surgeries that can be safely and cost-effectively delivered in the outpatient, ambulatory setting.

PRACTICAL COURSES

GE SE 12:30–4:00 pm Fee: $450

PC23 What You Need to Know When Looking for Your First (or Maybe Second) Job

COURSE DIRECTOR: Martina Stippler
FACULTY: W. Christopher Fox, Patrick P. Han, Robert A. Hirschl, Pedro M. Ramirez, Lowell J. Rossman, Stacey Q. Wolfe
COURSE DESCRIPTION: This course provides the a frame of reference to set expectations and develop a skill set needed for the transition from residency to first job, and for evaluating opportunities when moving between positions and looking for a new job. These skills needed but not covered during residency are consistently identified by oral board participants (e.g. 3-5 years after graduation) as one of the things that should have been taught earlier in their career.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Assess possible job opportunities in the current job market.
- Confidently evaluate the advantages and disadvantages of a job opportunity.
- Navigate the job application and interview process to secure a position that is a lasting fit.

SP 12:30–4:00 pm Fee: $450

PC24 Spinal Biomechanics in Modern Clinical Practice

COURSE DIRECTOR: Tyler R. Koski
FACULTY: Aruna Ganju, Ajit A. Krishnaney, Christopher M. Maulucci, Zachary A. Smith, Gregory R. Trost, Stephanus Viljoen
COURSE DESCRIPTION: Evaluate the impact of biomechanics on spine surgery ranging from degenerative to trauma to deformity.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Incorporate biomechanics into surgical planning for degenerative to trauma to deformity cases.
- Discuss the application of biomechanical principles to various spinal constructs.
- Identify and avoid common complications associated with a failure to understand the role of biomechanics in spinal constructs.

AP SP 12:30–4:00 pm Fee: $450

PC25 Thoracolumbar: Trauma, Tumor, and Degenerative—Case-based Presentations

COURSE DIRECTOR: Luis M. Tumialan
FACULTY: Ali A. Baaj, Mark H. Bilsky, Dean Chou, Shekar N. Kurpad, Mamerhi O. Okor, Laurence D. Rhines, Daniel M. Sciubba, Michael S. Virk
COURSE DESCRIPTION: Use case-based learning to describe the diagnosis and treatment of thoracolumbar trauma, tumor, and degenerative pathologies.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss techniques and approaches to treat thoracolumbar trauma, tumor, and degenerative pathologies.
- Determine appropriate indications and treatment pathways as well as guidelines for the treatment of thoracolumbar pathologies.
- Identify and avoid common complications associated with thoracolumbar spinal surgery.

TU 12:30–4:00 pm Fee: $450

PC26 3D Surgical Neuroanatomy (Infratentorial)

COURSE DIRECTOR: Juan Carlos Fernandez-Miranda
FACULTY: Spiros L. Blackburn, Aaron A. Cohen-Gadol, Anil Nanda, Pablo A. Rubino, Jeffrey M. Sorenson
COURSE DESCRIPTION: This course will review relevant surgical neuroanatomy using 3D stereoscopic projection. The areas covered will include cerebellum and fourth ventricle, posterior circulation, and lateral and posterior skull base approaches. Master surgeons will illustrate the importance of surgical neuroanatomy for clinical practice with surgical cases and HD/3D video illustrations. Surgical approaches to the cerebello-pontine angle, clival and petroclival region, jugular foramen, and foramen magnum will be discussed both from transcranial (retrosigmoid, anterior and posterior transpetrosal, suboccipital transcondylar) and endoscopic endonasal routes.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Review the surgical anatomy and approaches to the cerebellum, cerebello-pontine angle, and fourth ventricle.
- Identify the key surgical anatomy for navigating the posterior basal cisterns and exposing posterior circulation vessels.
- Discuss the different routes to the clival, petroclival and foramen magnum regions, including endoscopic endonasal and transcranial approaches.

TU 12:30–4:00 pm Fee: $450

PC27 Brain Tumor Update Part 2: Benign Brain Tumors

COURSE DIRECTORS: Randy L. Jensen, Isaac Yang
FACULTY: Daniel P. Cahill, Ricardo J. Komotar, Mark E. Linskey, Ramesh C. Mishra, Allen Waziri
COURSE DESCRIPTION: This course will discuss the appropriate use of radiosurgery and surgery for benign central and peripheral nervous tumors.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss contemporary management of benign tumors by microsurgery and endoscopy.
- Review contemporary management of benign tumors by radiosurgery.
- Detail contemporary management of specific tumor histologies, including skull base meningiomas, pituitary adenomas, acoustic neuromas, chordomas, peripheral nerve tumors, and pediatric tumors.
- Apply these treatment strategies or refer appropriate patients in their practice for surgery or radiosurgery therapy.

SF 12:30–4:00 pm Fee: $450

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

COURSE DIRECTOR: Daniel Curry
FACULTY: Shabbar F. Danish, David D. Gonda, Jorge A. Gonzalez-Martinez
COURSE DESCRIPTION: Implementing and integrating new technologies into established clinical practice can be challenging, but may lead to improved patient outcomes and further advancement of the field. Recent new technologies and their unique challenges and benefits will be discussed.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss the potential advantages of bringing new technology into the clinical workflow of an established practice.
- Review the challenges faced with integration of specific

technologies and how they may be managed to optimize efficient implementation.
- Identify the benefits and potential impact on patient outcome, along with available evidence, for recently developed technologies.

AP PA 12:30–4:00 pm Fee: $450

PC29 Neurosurgical Treatment of Chronic Headache

COURSE DIRECTORS: Jason M. Schwalb, Egilius Spierings
FACULTY: L. Dade Lunsford, Cormac O. Maher, Wouter I. Schievink, Ashwini D. Sharan, Jennifer A. Sweet
COURSE DESCRIPTION: This course will focus on the decision-making of neurosurgeons confronting patients with chronic headaches. Using case-based discussions, the faculty will discuss identification of patients who are likely to do well with neurosurgical intervention and those who are not. Evidence-based medical and surgical options will be discussed for each condition.
LEARNING OBJECTIVES: Upon completion of this course, attendees will be able to:
- Discuss appropriate workup and non-neurosurgical management of different causes of chronic headache.
- Develop patient selection tools to improve neurosurgical outcomes and apply these tools to their practices.
- Review current evidence-based treatment of chronic headache.

GE 12:30–4:00 pm Fee: $450

PC30 Clinical Trials 101: What Neurosurgeons Should Know

COURSE DIRECTOR: Michael A. Vogelbaum
FACULTY: Frederick G. Barker, Rebecca Betensky, Susan Chang, E. Antonio Chiocca, Frederick F. Lang, David A. Reardon, Nader Sanai, Joohee Sul, Patrick Wen
COURSE DESCRIPTION: This course is designed to allow neurosurgeons to gain practical knowledge about the types of clinical trials and the approaches to implementing them in the study of neuro-oncological devices and/or drugs.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Identify the various types of clinical trials routinely performed in neuro-oncology.
- Review study design considerations associated with each major type of trial.
- Discuss the regulatory issues associated with clinical trials and also the steps involved in the FDA for such device and drug trials.

TU 12:30–4:00 pm Fee: $450

PC31 Management of Challenging Brain Tumors

COURSE DIRECTOR: Jeffrey N. Bruce
FACULTY: Atul H. Goel, Alfredo Quinones-Hinojosa, Ganesh Rao, Michael A. Vogelbaum
COURSE DESCRIPTION: This course will use case presentations, didactic lectures, and interaction with faculty to provide clinical scenarios that represent some of the most challenging brain tumor cases, based on location. Appropriate management and techniques will be reviewed. Strategies designed to anticipate and avoid complication will be discussed.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Identify common challenges with a variety of cranial procedures.
- Plan strategies to manage and avoid complication in challenging brain tumors.
- Apply these treatment strategies and approaches in their own challenging cases.

AP GE 12:30–4:00 pm Fee: $450

PC32 Clinical Guidelines Development: A Primer on the Development and Review of Evidence-based Clinical Guidelines

COURSE DIRECTORS: Sepideh Amin-Hanjani, Jeffrey J. Olson, Timothy C. Ryken
FACULTY: Kevin M. Cockroft, Terrence Julien, Brian V. Nahed, Patricia B. Raksin, Beverly C. Walters
COURSE DESCRIPTION: This course is designed to provide novice and more advanced learners with the knowledge, skills, and tools to develop and to review evidence-based clinical practice guidelines and to advance the level of expertise of those who have previous experience in guideline development. The course content will offer a deep-dive into the guideline development process, including such topics as clinical question development, assessing evidence quality, and developing actionable recommendation statements, among others to stimulate discussion and advance the field of evidence-based medicine.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Identify the developmental process, procedures, forms, and templates that can be used or adapted for use in your own guideline development efforts.
- Outline how to conduct comprehensive and systematic evidence reviews, assess the quality of studies, create and interpret evidence tables and profiles, and grade the strength of recommendations.
- Assess the quality of guidelines.
- Illustrate challenges in guideline development (e.g., handling dissenting voices, incorporating patient values and preferences, dissemination and implementation).

SF 12:30–4:00 pm Fee: $450

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

COURSE DIRECTOR: Shabbar F. Danish
FACULTY: Daniel Curry, Robert E. Gross, Ganesh Rao
COURSE DESCRIPTION: MR-guided laser ablation is rapidly emerging as minimally invasive alternative for the treatment of epilepsy, metastatic tumors, radiation necrosis, cavernous malformations, and other intracranial pathology. In this course, we will review techniques, applications, and outcomes to illustrate the gaps this emerging technology can fill for neurosurgeons and prospective patients.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Explain the underlying principles of image-guided laser ablation.
- List the indications for MR-guided laser ablation.
- Describe the outcomes and risks of MR-guided laser ablation surgery.
- Apply these principles of patient selection for performance and/or referral of MR-guided laser ablation.

1:00-3:00 PM
CNS RESIDENT SANS CHALLENGE
Preliminary Round

SU OCT 8

GENERAL SCIENTIFIC SESSION I

GE 4:30–6:30 pm

General Scientific Session I

PRESIDING OFFICER: Ashwini D. Sharan
MODERATORS: Shekar N. Kurpad, Elad I. Levy
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify disruptions and new realities.
- Discuss how disruptions and new realities are affecting and changing health care and neurosurgery.
- Review strategies for adapting to disruptions and new realities.

4:30–4:49 pm

Opening Remarks
Alan M. Scarrow

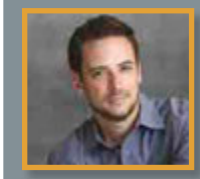
4:49–4:52 pm
Introduction of Richard Susskind
Alan M. Scarrow

4:52–5:12 pm
SPECIAL LECTURE

The Future of the Professions
Richard Susskind

5:12–5:15 pm
Introduction of Jamie Holmes
Elad I. Levy

5:15–5:45 pm
SPECIAL LECTURE



The Need for Closure in the Workplace: How Handling Ambiguity Well Improves Decision-making, Creativity, and Empathy
Jamie Holmes

5:45–5:48 pm
Introduction of NSI President
Shekar N. Kurpad

5:48–5:58 pm
NSI Presidential Address
Ramesh C. Mishra

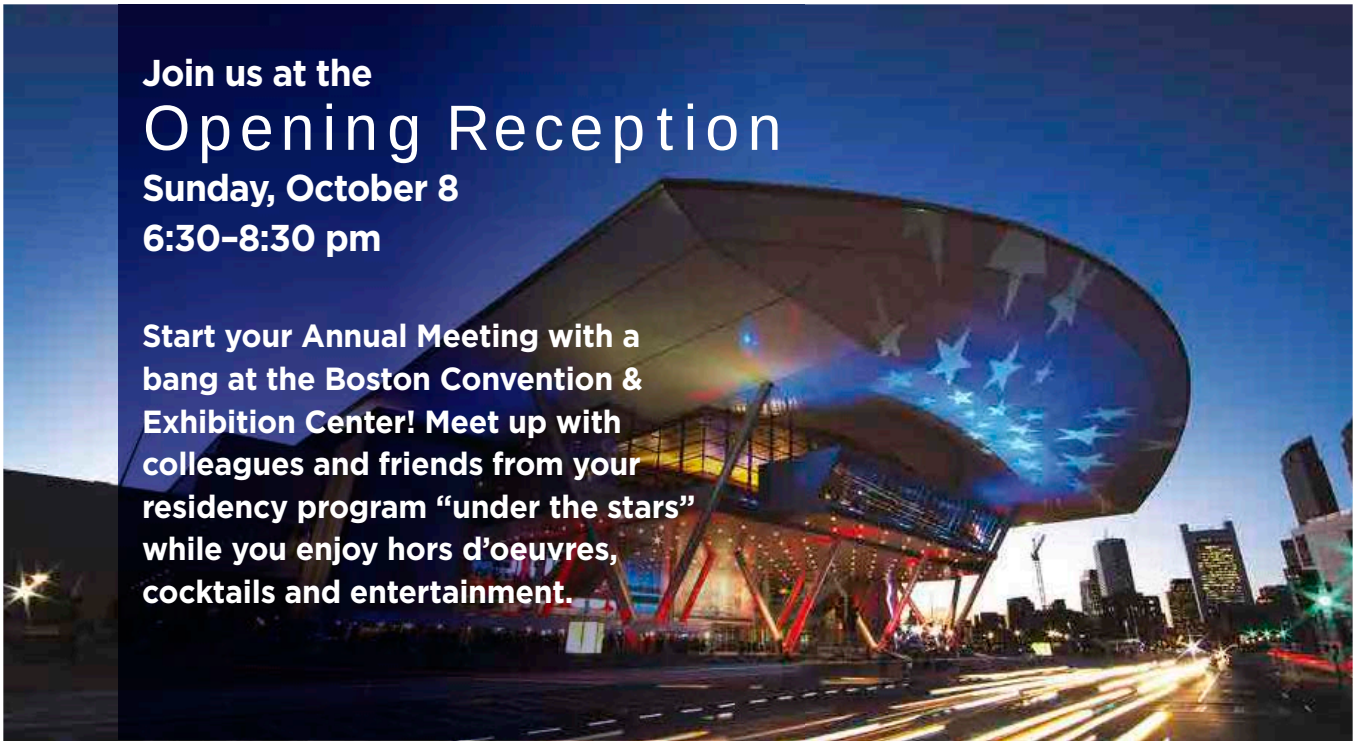
5:58–6:04 pm
***Neurosurgery* Cerebrovascular Paper of the Year**

6:04–6:10 pm
***Neurosurgery* Socioeconomic Paper of the Year**

6:10–6:16 pm
***Neurosurgery* Spine and Peripheral Nerves Paper of the Year**

6:16–6:22 pm
***Neurosurgery* Pediatric Paper of the Year**

6:22–6:28 pm
***Neurosurgery* Neurotrauma and Critical Care Paper of the Year**



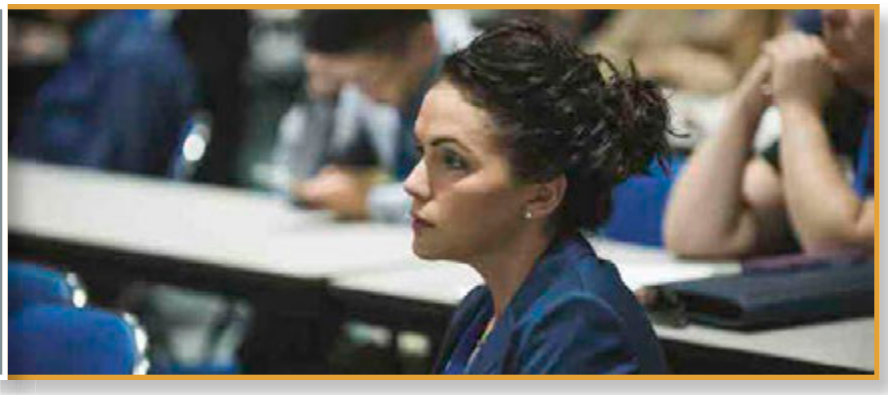
PROGRAM HIGHLIGHTS

MO
OCT 9

7:00-8:30 AM

GUIDELINES SESSIONS

Brain Tumors Update, Neurovascular Update, Neurotrauma Update, Spine Update



8:55-9:15 AM

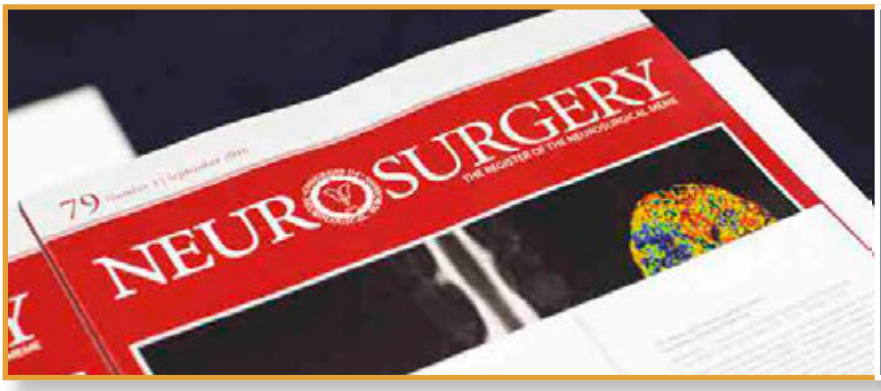
HONORED GUEST PRESENTATION

Humility
Alan R. Cohen

9:18-9:45 AM

SPECIAL LECTURE

AUGMENTED: Life in the Smart Lane
Brett King



12:05-12:15 PM

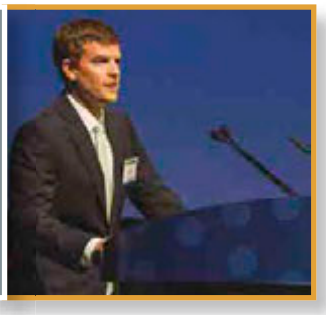
NEUROSURGERY PAPER OF YEAR

12:15-1:45 PM

LUNCHEON SEMINARS

4:15-6:15 PM

CASE-BASED DISCUSSION SESSIONS



GUIDELINES SESSIONS

TU 7:00–8:30 am

Guidelines on Brain Tumors Update

MODERATORS: Frederick G. Barker, Jason P. Sheehan
SPEAKERS: Manish K. Aghi, Isabelle M. Germano, Steven N. Kalkanis, Jeffrey J. Olson
COURSE DESCRIPTION: New updates on brain tumor guidelines will be published soon. All neurosurgeons should be knowledgeable of these updates. Authors will present key elements in order to equip you with what you need to know, and a panel of experts will comment on the guidelines for further perspective.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss current management guidelines regarding whole brain radiation and management of multiple brain metastases.
- Review current management guidelines regarding surgical resection of brain metastases.
- Interpret current management guidelines regarding retreatment and emerging therapies for brain metastases.
- Discuss current management guidelines regarding chemotherapy, prophylactic anticonvulsants, and steroid use for brain metastases.
- Evaluate current management guidelines regarding stereotactic radiation for brain metastases.
- Implement existing clinical guidelines in their treatment of brain metastases patients.

7:00–7:20 am
Nonfunctioning Pituitary Adenoma Guidelines
Manish K. Aghi

7:20–7:40 am
Acoustic Neuroma Guidelines
Isabelle M. Germano

7:40–8:00 am
Low-grade Glioma Guidelines
Jeffrey J. Olson

8:00–8:20 am
Brain Metastasis Guidelines
Steven N. Kalkanis

8:20–8:30 am
Questions and Discussion

TR 7:00–8:30 am

Guidelines on Neurotrauma Update

MODERATOR: Odette Harris
SPEAKERS: Sanjay S. Dhall, Deepak K. Gupta, Gregory W.J. Hawryluk, Mark R. Proctor, Patricia B. Raksin, Timothy C. Ryken
COURSE DESCRIPTION: The latest updates in guidelines for neurotrauma will be discussed. All neurosurgeons should be knowledgeable of the recent updates. Authors will present key elements in order to fully equip you with what you need to know, and a panel of experts will comment on the guidelines for further perspective.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss current management guidelines regarding ICP monitoring for severe traumatic brain injury.
- Review current management guidelines regarding hypothermia for severe traumatic brain injury.
- Discuss current management guidelines regarding thresholds for surgery for severe traumatic brain injury.
- Determine current management guidelines regarding DVT prophylaxis for severe traumatic brain injury.
- Apply these guidelines in their management of patients with neurotrauma.
- Analyze the most up-to-date guidelines on traumatic brain injury.

7:00–7:15 am
Traumatic Brain Injury (Surgical)
Gregory W.J. Hawryluk

7:15–7:30 am
Traumatic Brain Injury (Non-surgical)
Patricia B. Raksin

7:30–7:45 am
Traumatic Brain Injury (Pediatric)
Mark R. Proctor

7:45–8:00 am
Cervical Spine
Sanjay S. Dhall

8:00–8:15 am
Thoracolumbar Spine
Timothy C. Ryken

8:15–8:30 am
International Practices
Deepak K. Gupta

SUBSPECIALTY SESSION TRACK KEY

- AP = Advanced Practice Provider
- CV = Cerebrovascular
- GE = General
- PA = Pain
- PE = Pediatric
- RE = Resident
- SE = Socioeconomic
- SF = Stereotactic and Functional
- SP = Spine and Peripheral Nerves
- TR = Neurotrauma
- TU = Tumor

SP 7:00–8:30 am

Guidelines on Spine Update

MODERATORS: John J. Knightly, Marjorie C. Wang
SPEAKERS: Erica F. Bisson, Kai-Ming G. Fu, Zoher Ghogawala, Michael G. Kaiser, Daniel K. Resnick
COURSE DESCRIPTION: New updates on guidelines for spine will be discussed. All neurosurgeons should be knowledgeable of these updates. Authors will present key elements in order to equip you with what you need to know, and a panel of experts will comment on the guidelines of these guidelines.
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss the management guidelines regarding medical management of traumatic thoracic and lumbar spine fractures.
- Evaluate the management guidelines regarding operative vs. non-operative treatment for traumatic thoracic and lumbar spine fractures.
- Assess the management guidelines regarding timing of surgical intervention for traumatic thoracic and lumbar spine fractures.
- Discuss the management guidelines regarding surgical approaches for the management of traumatic thoracic and lumbar fractures.
- Review the management guidelines regarding novel surgical strategies for traumatic thoracic and lumbar spine fractures for further perspective.
- Summarize current guidelines related to surgical management of degenerative thoracic spine disease.
- Apply these protocols and data to the care of cervical spine injured patients in their practice.

7:00–7:15 am
The Swedish Spondylolisthesis Study Results and Critiques
Marjorie C. Wang

7:15–7:30 am
The SLIP Study: Was it Powered to Show a Difference in the Use of Fusion for Spondylolisthesis?
Zoher Ghogawala

7:30–7:45 am
What is N2QOD Teaching Us Regarding Lumbar Spondylolisthesis Treatment?
Erica F. Bisson

7:45–8:00 am
What Do the Lumbar Fusion Guidelines Say About Spondylolisthesis?
Michael G. Kaiser

8:00–8:15 am
How to Synthesize Existing Data on Spondylolisthesis Treatment Decision-making
Daniel K. Resnick

8:15–8:30 am
Minimally Invasive Deformity Surgery Guidelines
Kai-Ming G. Fu

CV 7:00–8:30 am

Guidelines on Neurovascular Update

MODERATOR: Kevin M. Cockroft
SPEAKERS: E. Sander Connolly, J D. Mocco, Stacey Q. Wolfe
COURSE DESCRIPTION: The latest updates in neurovascular guidelines will be discussed. All neurosurgeons should be knowledgeable of the recent updates. Authors will present key elements in order to fully equip you with what you need to know, and a panel of experts will comment on the guidelines for further perspective.
LEARNING OBJECTIVES: Upon the completion of this course, participants will be able to:

- Review evidence-based guidelines in the treatment of intracerebral hemorrhage.
- Summarize current guidelines regarding neurovascular conditions.
- Apply these protocols and data to the neurovascular care patients in their practice.

7:00–7:25 am
AVMs
Stacey Q. Wolfe

7:25–7:50 am
SAH
E. Sander Connolly

7:50–8:15 am
Ischemic Stroke
J D. Mocco

8:15–8:30 am
Questions and Discussion

GENERAL SCIENTIFIC SESSION II

MO
OCT 9

GE 8:45 am–12:15 pm

General Scientific Session II

PRESIDING OFFICER: Steven N. Kalkanis
MODERATORS: Ashok R. Asthagiri, Brian L. Hoh
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify examples of consolidation and value.
- Discuss how consolidation and value are affecting/changing health care and neurosurgery.
- Discuss strategies for adapting to consolidation and value.

8:45–8:53 am

Opening Remarks
Alan M. Scarrow

8:53–8:55 am
Introduction of Honored Guest
Alan M. Scarrow

8:55–9:15 am

Humility
Alan R. Cohen

9:15–9:18 am
Introduction of Brett King
Brian L. Hoh

9:18–9:45 am

Special Lecture
AUGMENTED: Life in the Smart Lane
Brett King

9:45–10:45 am
MORNING BEVERAGE BREAK
Visit the Exhibit Hall!

10:45–10:48 am
Introduction of Amy Bassano
Ashok R. Asthagiri

10:48–11:18 am

Special Lecture
Amy Bassano

11:18–11:28 am
2017 CNS Resident Award Presentation
SIRT1 Activation: A Strategy for Harnessing Endogenous Protection Against SAH-induced Neurovascular Dysfunction
Ananth K. Vellimana

11:28–11:38 am
CNS Innovator of the Year Award Presentation
Brian L. Hoh

11:38–11:59 am
Immersive VR Case Discussions
Peter Nakaji, Nicholas Bambakidis, Neil Martin, Warren Selman, and John Golfinos

11:59 am–12:05 pm
***Neurosurgery* Tumor Paper of the Year**

12:05–12:15 pm
***Neurosurgery* Paper of the Year**

CNS

360° Virtual Reality in Neurosurgery

presented by the CNS and Surgical Theater

SURGICAL THEATER

For breaking updates, visit **cns.org/2017.**

Experience nonstop, high-tech innovation at the CNS Annual Meeting!

Immerse yourself in expert panel case discussions during Monday's General Scientific Session as the CNS and Surgical Theater bring an unprecedented neurosurgical virtual reality experience to the main stage.

Watch our faculty experts discuss three challenging cases in an immersive virtual reality environment and follow along as they plan their approach using your own smartphone and provided VR viewer to access 360° video of the case.

Virtual reality viewers will be provided to all attendees in Boston. To participate, you must download the VR mobile app prior to the session. Look for details and download instructions in early fall.

MO OCT 9 LUNCHEON SEMINARS

12:15–1:45 pm

All Luncheon Seminars include a plated lunch served in the seminar room.
Luncheon Seminar fee is $95 each ($75 for residents, fellows, medical students, and advance practice providers).

RE

MO1 Honored Guest Luncheon: The Art of the Talk

Complimentary for CNS Resident members!

SPEAKER: Alan R. Cohen

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

- Recognize the differences between oral and written presentations.
- Identify methods to help the speakers connect with the audience.
- Demonstrate strategies to enhance the quality of the lectures.

Educational Grant provided by Arbor Pharmaceuticals, LLC.

SANS ANNUAL MEETING — *SANS supplemental exam is available for an additional $15.*

CV RE

MO2 7 Aneurysms

MODERATOR: Michael T. Lawton

FACULTY: Daniel L. Barrow, Rohen R. Harrichandparsad, Ali F. Krisht, Basant K. Misra

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

- Discuss the epidemiology and natural history of ruptured and unruptured aneurysms.
- Outline treatment strategies for different aneurysms.
- Describe important concepts in microsurgery.
- Apply this knowledge in counseling of patients and surgical management of aneurysms.

CV

MO3 Hematology and Coagulation for Neurosurgeons

MODERATOR: Judy Huang

FACULTY: David M. Hasan, Alan S. Hoffer, Robert F. James, Shahid M. Nimjee

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

- Explain important coagulation mechanisms, parameters, and clinical pearls in the evaluation of the coagulopathic patient.
- List important screening guidelines and define the key points of emergency and intraoperative decision making.
- Apply these guidelines in pharmacological reversal of the neurosurgical patient with a coagulopathy.

PE

MO4 Starting a Fetal Myelomeningocele Surgery Program

MODERATORS: Hal S. Meltzer, William E. Whitehead

FACULTY: Edward S. Ahn, Alex J. Schupper, Charles B. Stevenson, Nicholas M. Wetjen

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

- Identify key elements needed to facilitate initiating a fetal surgery program.
- Discuss training requirements and volume/outcome relationships relative to fetal surgery.
- Identify administrative challenges and opportunities for new programmatic development in fetal surgery.

SANS ANNUAL MEETING — *SANS supplemental exam is available for an additional $15.*

SP

MO5 Peripheral Nerve Entrapment Syndromes: Diagnosis and Management

MODERATOR: Line G. Jacques

FACULTY: Justin M. Brown, Shaun T. O'Leary, Gabriel C. Tender, Christopher J. Winfree, Lynda Jun-San Yang

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

- Describe surgical exposures and techniques for common peripheral nerve pathologies.
- Determine appropriate diagnostic workup and diagnosis of patients with peripheral nerve entrapment.
- Identify and avoid common complications associated with peripheral nerve surgery.

SP

MO6 Spinal Column Metastases Management

MODERATOR: Joseph S. Cheng

FACULTY: Mark H. Bilsky, Mohamad Bydon, Dean Chou, Michael W. Groff, Ilya Laufer

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

- Discuss techniques and approaches to treat metastatic spine disease.
- Determine appropriate indications and treatment pathways as well as guidelines for the treatment of metastatic spine disease.
- Identify and avoid common complications associated with metastatic spinal disease.

RE SP

MO7 Navigation in Spine Surgery: Robotics—The Future is Now

MODERATOR: Eric W. Nottmeier

FACULTY: Christopher M. Holland, Michael P. Steinmetz, Cheerag D. Upadhyaya, Michael S. Virk

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

- Discuss the evidence basis for novel spinal technologies and techniques.
- Evaluate how new spinal techniques and technologies can be incorporated into your clinical practice.
- Identify the relative strengths and weakness of novel techniques compared to more traditional approaches.

SUBSPECIALTY SESSION TRACK KEY

- AP = Advanced Practice Provider
- CV = Cerebrovascular
- GE = General
- PA = Pain
- PE = Pediatric
- RE = Resident
- SE = Socioeconomic
- SF = Stereotactic and Functional
- SP = Spine and Peripheral Nerves
- TR = Neurotrauma
- TU = Tumor

SF

M08 Minimally Invasive Epilepsy Surgery

MODERATOR: Sarat P. Chandra
FACULTY: Prakash Chandra, David D. Gonda, Charles Y. Liu
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

AP RE SF

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

MODERATORS: Aviva Abosch, Emad N. Eskandar
FACULTY: W. Jeffrey Elias, Clement Hamani, Sameer A. Sheth, Philip A. Starr
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

AP TR

M10 Diagnosis and Management of Concussion and Athletic Clearance

MODERATOR: Kerry E. Brega
FACULTY: Julian E. Bailes, Michael L. Levy, David O. Okonkwo, Chad J. Prusmack
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Analyze guidelines for diagnosis and management of sports concussion.
- Evaluate newest technology for concussion testing in athletes.
- Evaluate the latest guidelines for return-to-play/school after sports concussion.
- Examine how multidisciplinary teams can create systems to treat athletes with TBI.

RE TU

M11 Update on Diagnosis and Management of Low-grade Gliomas

MODERATORS: Mitchel S. Berger, Linda M. Liau
FACULTY: Brian V. Nahed, Ian F. Pollack, Nader Sanai, Ashish Suri, Viviane S. Tabar
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe multidisciplinary approaches to treating low-grade gliomas.
- Discuss recent guidelines for managing low-grade gliomas.
- Outline patient specific approaches to treating low-grade gliomas.

TU

M12 Immunotherapy-based Therapies for Gliomas and Brain Metastasis

MODERATOR: William T. Curry
FACULTY: Orin Bloch, Gavin P. Dunn, Duane Mitchell, Edjah K. Nduom, Elias Sayour
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the current role of immunotherapy in treatment of gliomas
- Describe the current role of immunotherapy in treatment of brain metastases.
- Discuss the current clinical trials for immunotherapy treatment options.

AP RE SE

M13 Making Sense of MACRA

MODERATOR: John Allen Wilson
FACULTY: Katie O. Orrico, Ann M. Parr, Shelly D. Timmons
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the components of the MACRA legislation pertinent to neurosurgeons.
- Comprehend the choices involved when choosing one of the different penalty programs.
- Share this information with their practices and implement their optimal choice going forward.

GE

M14 Educating Neurosurgeons: The Science and Art of Teaching Surgery

MODERATOR: Maryam Rahman
FACULTY: Nicholas M. Barbaro, W. Christopher Fox, Judy Huang, David W. Roberts, Stacey Q. Wolfe
LEARNING OBJECTIVES: Upon completion of the course, participants will be able to:

- Discuss generational differences between millennials and other generations, and develop strategies to best educate given these differences.
- Identify gender and cultural differences, and develop strategies to best educate given these differences.
- Learn and employ strategies for technical skill training, feedback, and evaluation.

1:45-2:45 pm
VISIT THE EXHIBIT HALL FOR A BEVERAGE BREAK & LIVE SURGERY

AFTERNOON SESSIONS

SECTION SESSIONS

SE 2:45–4:15 pm

Council of State Neurosurgical Societies

MODERATORS: Joshua M. Rosenow, Ann R. Stroink
SPEAKERS: Gary M. Bloomgarden, Chaim B. Colen, Robert A. Hirschl, Sherry L. Taylor
LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*

- Identify the differences between a hospital-employed and a private-practice pattern.
- Review strategies to analyze a present or possible future practice to assess whether it might be a good fit.
- Analyze the findings of novel neurosurgical studies, and critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.

2:45–3:27 pm
Being Hospital-employed

2:45–3:00 pm
Pro
Gary M. Bloomgarden, Sherry L. Taylor

3:00–3:15 pm
Con
Chaim B. Colen, Robert A. Hirschl

3:15–3:27 pm
Questions and Discussion

3:27–4:15 pm
Oral Presentations
See pages page 62 for Oral Papers 109-116.

CV 2:45–4:15 pm

Section on Cerebrovascular Surgery

MODERATORS: Randy S. Bell, Ajith J. Thomas
SPEAKER: Gregory J. Zipfel
LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*

- Review development and history of cerebrovascular surgical techniques.
- Compare the efficacy of older intervention with newer techniques.
- Analyze the findings of novel neurosurgical studies, and critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.

2:45–3:45 pm
Oral Abstract Presentations
See pages 62-63 for Oral Papers 117-126.

3:45–3:50 pm
Introduction of Drake Lecturer
Gregory J. Zipfel

3:50–4:15 pm
Drake Lecture
Daniel L. Barrow

SP 2:45–4:15 pm

Section on Disorders of the Spine and Peripheral Nerves

MODERATORS: Frank La Marca, Daniel J. Hoh
SPEAKERS: Erica F. Bisson, Domagoj Coric, Michael W. Groff, Regis W. Haid, Matthew J. McGirt, Sarat P. Chandra, Daniel M. Sciubba, Juan S. Uribe, Michael Y. Wang
LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*

- Discuss the indications and complication avoidance associated with the lateral approach for adult deformity correction.
- Identify the indications and evidence basis for the use of expandable interbody spacers in degenerative lumbar surgery.
- Review the common complications associated with spinal tumor and trauma surgery and discuss strategies to minimize complications.

2:45–2:54 pm
Cervical Kyphosis: Case with a Neurological Complication—Avoidance and Treatment
Regis W. Haid

2:55–3:04 pm
C2 Fracture: Case with a Complication—Avoidance and Treatment
Erica F. Bisson

3:05–3:14 pm
Post-radiation Osteomyelitis and Kyphosis: Cases and Treatment
Domagoj Coric

3:15–3:24 pm
Lateral Approach for Spinal Deformity: Case with a Vascular Complication—Avoidance and Treatment
Juan S. Uribe

3:25–3:34 pm
Lumbar Degenerative Fusion: Case with Expandable Spacer—Complication Avoidance and Treatment
Matthew J. McGirt

3:35–3:44 pm
Outpatient Endoscopic Lumbar Fusion Surgery: Lessons Learned
Michael Y. Wang

3:45–3:54 pm
Spinal Tumors: Case with a Complication—Avoidance and Treatment
Daniel M. Sciubba

3:55–4:04 pm
Spinal Trauma: TL Junction Case with a Complication—Avoidance and Treatment
Michael W. Groff

4:05–4:15 pm
Summary of Lessons Learned From Surgical Treatment of More Than 2000 Cases with Craniovertebral Junction Instability
Sarat P. Chandra

TR 2:45–4:15 pm

Section on Neurotrauma and Critical Care

MODERATORS: Kathryn M. Beauchamp, Gary T. Schwartzbauer
SPEAKERS: Kathryn M. Beauchamp, Deepak Gupta, Allan D. Levi, Geoffrey T. Manley, Daniel B. Michael, David O. Okonkwo, Martina Stippler, Shelly D. Timmons

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Define the considerations for decompressive craniectomy in the traumatic brain injury patient.
- Analyze the indications for hypothermia in the brain injury population.
- Compare and contrast the treatment of brain injury in the U.S. and India.

2:45–2:48 pm
Introduction of Marmarou Lecturer
Kathryn M. Beauchamp

2:48–3:18 pm
Mechanisms of TBI: Can We Learn the Meaning of the Message by Studying the Chemistry of the Ink?
Daniel B. Michael

3:18–3:34 pm
Debate: Decompressive Craniectomy: Is It Over?

3:18–3:26 pm
Yes, It's Over
Martina Stippler

3:26–3:34 pm
No, It's Not Over
Shelly D. Timmons

3:34–3:50 pm
Debate: Hypothermia in Neurotrauma: Past or Future?

3:34–3:42 pm
Past
David O. Okonkwo

3:42–3:50 pm
Future
Allan D. Levi

3:50–4:05 pm
Traumatic Brain Injury
Geoffrey T. Manley

4:05–4:15 pm
Neurotrauma in India
Deepak K. Gupta

PA 2:45–4:15 pm

Section on Pain

MODERATOR: Darlene A. Lobel, Jason M. Schwalb
SPEAKERS: John D. Markman, Christopher J. Winfree
LEARNING OBJECTIVES: *Upon completion of this session, participants will be able to:*
- Interpret evidence related to opioid efficacy in the treatment of pain and safe prescribing practices.
- Discuss the indications for use of medical marijuana, evidence, state and federal regulations, and relevance to neurosurgical practice.
- Describe ongoing research in the neurosurgical treatment of pain.

2:45–3:33 pm
The Opioid Epidemic and Medical Marijuana

2:45–3:05 pm
Opioid Prescribing in Neurosurgical Practice: Balancing Relief and Risks
John D. Markman

3:05–3:25 pm
Medical Marijuana: What Neurosurgeons Need to Know to Optimize the Treatment of Their Chronic Pain Patients
Christopher J. Winfree

3:25–3:33 pm
Questions and Discussion

3:33–4:15 pm
Oral Presentations
See page 63 for Oral Papers 127-132.

PE 2:45–4:15 pm

Section on Pediatric Neurological Surgery

MODERATORS: Edward S. Ahn, Elias B. Rizk
SPEAKER: R. Michael Scott
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.
- Discuss opportunities to integrate quality improvement leadership into a clinical career.
- Review the importance of continuous efforts to improve patient safety and reduce preventable errors in healthcare facilities.

2:45–3:45 pm
Oral Abstract Presentations
See page 63 for Oral Papers 134-143.

3:45–4:15 pm
Perspectives on a Career in Quality Improvement
R. Michael Scott

SF 2:45–4:15 pm

Section on Stereotactic and Functional Neurosurgery

MODERATORS: Emad N. Eskandar, Jonathan Miller
SPEAKERS: Steven M. Falowski, Sean J. Nagel, Ashwini D. Sharan
LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*
- Discuss different methods for spinal cord stimulator implant, including different anesthetic regimens, and its impact on clinical outcomes.
- Review spinal cord stimulation outcomes using novel stimulation paradigms, including burst and high frequency stimulation.
- Define the indications for dorsal root ganglion stimulation and how this approach differs from traditional spinal cord stimulation.
- Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.

2:45–3:30 pm
Emerging Concepts in Spinal Cord Stimulation

2:45–3:00 pm
Asleep Spinal Cord Stimulator Implantation
Steven M. Falowski

3:00–3:15 pm
Burst and High Frequency Spinal Cord Stimulation
Ashwini D. Sharan

3:15–3:30 pm
Dorsal Root Ganglion Stimulation
Sean J. Nagel

3:30–4:15 pm
Oral Abstract Presentations
See pages 63-64 for Oral Papers 144-150.

AFTERNOON SESSIONS

TU 2:45–4:15 pm

Section on Tumors

MODERATORS: Edward R. Laws, Jason P. Sheehan, Brooke Swearingen
SPEAKERS: Ian F. Dunn, Paul A. Gardner, Gabriel Zada
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss the preoperative assessment of the patient and the role of intraoperative imaging in the treatment of nonfunctioning pituitary adenoma.
- Review the role of mitotic indices in predicting the behavior of pituitary adenoma and the potential role of immune-related biomarkers such as programmed death ligand 1 (PD-L1) in their treatment.
- Evaluate the role of intraoperative imaging including navigation and intraoperative MRI in pituitary surgery.
- Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.

2:45–3:30 pm
Nonfunctioning Pituitary Adenoma Guidelines and Contemporary Management

2:45–3:00 pm
Nonfunctioning Adenoma Guidelines
Paul A. Gardner

3:00–3:15 pm
Pituitary Adenoma Genomics/Immune-related Biomarkers
Ian F. Dunn

3:15–3:30 pm
Modern Techniques in Pituitary Surgery
Gabriel Zada

3:30–4:15 pm
Oral Abstract Presentations
See page 64 for Oral Papers 151-158.

NEW! CASE-BASED DISCUSSION SESSIONS

Faculty will present cases to be examined, discussed, and debated by both the audience and the panel. Registered attendees are encouraged to submit cases for consideration prior to the session. **Visit cns.org/2017 for details.**

CV 4:15–6:15 pm

Case-based Discussion Session—Aneurysms

MODERATOR: Stavropoula I. Tjoumakaris
FACULTY: Felipe Albuquerque, H. Hunt Batjer, Robert H. Rosenwasser, Robert A. Solomon
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

SP 4:15–6:15 pm

Case-based Discussion Session—Cervical Trauma

MODERATOR: James S. Harrop
FACULTY: Michele M. Johnson, Iain H. Kalfas, Eric A. Potts, John E. Ziewacz
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

TR 4:15–6:15 pm

Case-based Discussion Session—Traumatic Brain Injury

MODERATOR: Jamie S. Ullman
FACULTY: Odette Harris, Gregory W.J. Hawryluk, Joshua E. Medow, Daniel B. Michael, Uzma Samadani, Eve C. Tsai
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss various treatment options for the management of traumatic brain injury.
- Strategize how to identify and avoid complications in surgery for traumatic brain injury.
- Discuss new technologies and monitoring for traumatic brain injury

PA 4:15–6:15 pm

Case-based Discussion Session—Management of Trigeminal Neuralgia

MODERATORS: Jason M. Schwalb, Jennifer A. Sweet
FACULTY: Jeffrey A. Brown, Kim J. Burchiel, Milind S. Deogaonkar, William A. Friedman
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

PE 4:15–6:15 pm

Case-based Discussion Session—Incidental Discoveries on Pediatric Neuroimaging

MODERATOR: Cormac O. Maher
FACULTY: David M. Frim, Karin Muraszko, R. Michael Scott, Nathan R. Selden
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss various treatment options for the pediatric incidentalomas.
- Describe common complications in pediatric incidentaloma surgery.
- Strategize how to identify and avoid complications in pediatric incidentalomas surgery.

SUBSPECIALTY SESSION TRACK KEY

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- CV = Cerebrovascular
- GE = General
- PA = Pain
- PE = Pediatric
- RE = Resident
- SE = Socioeconomic
- SF = Stereotactic and Functional
- SP = Spine and Peripheral Nerves
- TR = Neurotrauma
- TU = Tumor

SF 4:15–6:15 pm

Case-based Discussion Session—Epilepsy

MODERATOR: Joseph S. Neimat
FACULTY: Aviva Abosch, Itzhak Fried, Steven N. Roper
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

TU 4:15–6:15 pm

Case-based Discussion Session—Pituitary Tumors

MODERATOR: Gabriel Zada
FACULTY: James J. Evans, Christopher James Farrell, John Anthony Jane, Edward H. Oldfield, Nelson M. Oyesiku
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

DINNER SEMINAR 2

Complimentary shuttle service will be provided for all dinner seminars. Shuttles will depart from the Westin Boston Waterfront Hotel.

MO OCT 9

SP 7:30–9:30 pm

Fee: $190 (includes three-course dinner and beverage)

DIN2 Frontiers in Spine Surgery: Artificial Discs, Robotics/Navigation, Spinal Endoscopy, and Minimally Invasive Surgery

MODERATORS: Praveen V. Mummaneni, Mark Edwin Shaffrey
FACULTY: Domagoj Coric, Adam S. Kanter, Nicholas Theodore, Juan S. Uribe, Michael Y. Wang
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify new treatment options for patients needing spinal surgery.
- Define indications for surgery using spinal navigation and robotics.
- Compare open and minimally invasive spine surgery.

Strega Waterfront
At Strega Waterfront, experience old-world Italian classics served in a glamorous setting. Buzzing with New York ambiance, this upscale Seaport District location affords an opportunity to catch local celebrities soaking up the harbor view.

American Express' Executive Travel: Boston's Best Restaurants; Zagat: Boston's Best Waterside Dining

DINNER SEMINAR 3

Complimentary shuttle service will be provided for all dinner seminars. Shuttles will depart from the Westin Boston Waterfront Hotel.

MO OCT 9

TU 7:30–9:30 pm

Fee: $190 (includes three-course dinner and beverage)

DIN3 Skull Base Tumors: Contemporary Management

MODERATOR: Jacques J. Morcos
FACULTY: Ossama Al-Mefty, John G. Golfinos, Ajay Niranjan
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss the different surgical approaches (both endoscopic and open), radiosurgical methods, and adjuvant treatments applicable to skull base tumors.
- Review the state-of-the-art techniques and limitations of each surgical approach.
- Compare surgical results and complications, with an emphasis on the most common pathologies encountered in clinical practice.

Ristorante Fiore
Located in Boston's historic North End, Ristorante Fiore is a sophisticated venue serving a seasonally inspired classic Italian menu. Dine on fresh, handmade breads, pastas, and old-world Italian plates to inventive, locally sourced seafood dishes. Fiore's private dining room overlooks the vibrant scene of Hanover Street in the heart of Boston's Italian community.

Zagat: Boston's Where to Eat & Drink in the North End

TU OCT 10 PROGRAM HIGHLIGHTS

7:00-8:30 AM

LATE-BREAKING ABSTRACTS SESSION

RAPID-EXCHANGE ORAL PRESENTATIONS 1

8:55-9:20 AM

TOP ABSTRACT PRESENTATIONS

10:50-11:10 AM

SPECIAL LECTURE

Affordable Health Care

Devi Prasad Shetty

11:13-11:37 AM

SPECIAL LECTURE

Bernard J. Tyson

4:15-6:15 PM

CASE-BASED DISCUSSION SESSIONS

RAPID-EXCHANGE ORAL PRESENTATIONS

GE 7:00–8:30 am

Rapid-exchange Oral Presentations 1

MODERATORS: W. Christopher Fox, John F. Reavey-Cantwell

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

- Analyze the findings of novel neurosurgical studies, and critique the design and methodology.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.
- Apply lessons of ongoing research to neurosurgical care of patients.

FULL DETAILS ON PAGES 69-73

GENERAL SCIENTIFIC SESSION III

GE 8:45 am–12:15 pm

General Scientific Session III

PRESIDING OFFICER: Ganesh Rao
MODERATORS: Nicholas C. Bambakidis, James S. Harrop
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify examples of individuals to populations: centers to systems.
- Discuss how individuals to populations: centers to systems are affecting/changing health care and neurosurgery.
- Review strategies for adapting to individuals to populations: centers to systems.

8:45–8:48 am
Introductions and Disclosures
James S. Harrop

8:48–8:52 am
Top Spine and Peripheral Nerves Abstract
Lumbar Fusion Versus Laminectomy for Spondylolisthesis: Lessons Learned from the AANS/CNS Spine Section Study Group's Analysis of the N2QOD Registry
Michael S. Virk

8:52–8:56 am
Top Pediatric Abstract
Exome Sequencing Identifies Novel Molecular Determinants of Human Congenital Hydrocephalus
Charuta G. Furey

8:56–9:00 am
Top Tumor Abstract
PREUSS AWARD
Metabolic Characterization of IDH1mutant and IDH Wildtype Gliomaspheres Uncovers Cell-type Specific Vulnerabilities
Matthew Garrett

9:00–9:04 am
Top Cerebrovascular Abstract
Stereotactic Radiosurgery for Spetzler-Martin Grade IV and V Arteriovenous Malformations: An International Multicenter Study
Jason P. Sheehan

9:04–9:08 am
Top Stereotactic and Functional Neurosurgery Abstract
Incorporating Newly Learned with Established Information within the Prefrontal Cortical Network
Matthew Luchette

9:08–9:12 am
Top Socioeconomic Abstract
Correlation Between Press Ganey Scores and Quality Outcomes from N2QOD (Lumbar Spine) for a Hospital-employed Neurosurgical Practice
William C. Olivero

9:12–9:16 am
Top Neurotrauma and Critical Care Abstract
THINKFIRST AWARD
FVIIa Prevents the Progressive Hemorrhaging of a Brain Contusion by Protecting Microvessels Via Formation of the TF-FVIIa-FXa Complex
Qiang Yuan

9:16–9:20 am
Top Pain Abstract
RONALD R. TASKER YOUNG INVESTIGATOR AWARD
Neuropathic Pain and Ectopic Spontaneous Action Potential Activity of Human Primary Sensory Neurons
Robert Y. North

9:20–9:33 am
NEXUS Presentation
Nicholas C. Bambakidis, Peter Nakaji

9:33–9:45 am
***Neurosurgery* High-impact Manuscript: Comparison of Patient Outcomes in 3725 Overlapping Versus 3633 Non-overlapping Neurosurgical Procedures Using a Single Institution's Clinical and Administrative Database**
Corinna C. Zygourakis

9:45–10:45 am
MORNING BEVERAGE BREAK
Visit the Exhibit Hall!

10:45–10:50 am
Introduction of Dr. Devi Prasad Shetty
Alan M. Scarrow

10:50–11:10 am
SPECIAL LECTURE

Affordable Health Care
Devi Prasad Shetty

11:10–11:13 am
Introduction of Bernard J. Tyson
James S. Harrop

11:13–11:37 am
SPECIAL LECTURE

Bernard J. Tyson

11:37–11:40 am
DISTINGUISHED SERVICE AWARD PRESENTATION

Richard Ellenbogen
presented by
Russell R. Lonser

11:40–11:43 am
FOUNDER'S LAUREL AWARD PRESENTATION

Steven L. Giannotta
presented by
Russell R. Lonser

11:43 am–12:03 pm
HONORED GUEST

Simplicity
Alan R. Cohen

12:03–12:07 pm
AANS President
Alex B. Valadka

12:07–12:11 pm
WINS President
Ann M. Parr

12:10–12:15 pm
NEUROSURGERY® Publications EIC Presentation
Nelson M. Oyesiku

TU OCT 10 LUNCHEON SEMINARS

12:15–1:45 pm

All Luncheon Seminars include a plated lunch served in the seminar room.
Luncheon Seminar fee is $95 each ($75 for residents, fellows, medical students, and advance practice providers).

CV

T15 Dural AV Fistula Diagnosis and Management

MODERATOR: Bernard R. Bendok
FACULTY: Rose Du, Andrew F. Ducruet, Louis J. Kim, Andrew J. Ringer
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Define a dural arteriovenous fistula and identify those at high-risk to hemorrhage.
- Comprehend dAVF classification and how to select a target.
- List the available embolization targets and which is appropriate for different fistulas.

TU

T16 ICH Trial Update

MODERATOR: Gregory J. Zipfel
FACULTY: Mohammad A. Aziz-Sultan, E. Sander Connolly, Neil A. Martin, Mario Zuccarello
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- List the new minimally invasive technologies available for clot evacuation.
- Describe which patients may benefit from these new technologies.
- Be aware of the techniques required to maximize the effectiveness of each device.

PA

T17 Retreating Trigeminal Neuralgia

MODERATOR: Ellen L. Air
FACULTY: Sharona Ben-Haim, Steven L. Giannotta, Konstantin V. Slavin, Jennifer A. Sweet
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

PE

T18 Tethered Cord: Practice Variations and Evidence Update

MODERATOR: Karin Muraszko
FACULTY: Lance S. Governale, Gerald A. Grant, Hal S. Meltzer, Nathan R. Selden
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss data available for tethered cord indications.
- Identify practice variations and discuss expert experience.
- Review pros and cons of early surgery in the minimally or asymptomatic patient.

SP

T19 Controversies in Spinal Deformity Surgery

MODERATOR: Christopher I. Shaffrey
FACULTY: Kai-Ming G. Fu, Paul K. Kim, Tyler R. Koski, Paul Park, Sarah Woodrow
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss techniques and approaches to treat adult deformity.
- Determine appropriate indications and treatment pathways for adult deformity patients.
- Identify and avoid common complications associated with thoracolumbar and cervical deformity.

SANS ANNUAL MEETING

SANS supplemental exam is available for an additional $15.

SP

T20 Cervical Radiculopathy: Anterior Versus Posterior Approaches

MODERATOR: R. John Hurlbert
FACULTY: Tim E. Adamson, Scott A. Meyer, Natarajan Muthukumar, Vedantam Rajshekhar, Christopher E. Wolfla
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Determine which patients would benefit from anterior versus posterior approaches to treat cervical radiculopathy.
- Describe common complications associated with anterior and posterior cervical spine approaches.
- Identify strengths and weaknesses of anterior cervical discectomy and fusion/arthroplasty versus posterior minimally invasive laminoforaminotomy versus laminoplasty.

SP

T21 Spinal Surgery Controversies: Case-based Interactive Discussion

MODERATOR: Praveen V. Mummaneni
FACULTY: Sanjay Behari, Zoher Ghogawala, Iain H. Kalfas, John J. Knightly, Rishi K. Wadhwa
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Comprehend the evidence basis for decompression alone versus decompression and fusion in the treatment of spondylolisthesis.
- Evaluate the pros and cons of open versus minimally invasive treatment for lumbar degenerative pathologies.
- Define the treatment alternatives for treatment of cervical radiculopathy.

SF

T22 Building a Functional Neurosurgery Practice

MODERATOR: Michael Schulder
FACULTY: Gordon H. Baltuch, Kelly D. Foote, Joshua M. Rosenow, Ashwin Viswanathan
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

SUBSPECIALTY SESSION TRACK KEY

- AP = Advanced Practice Provider
- CV = Cerebrovascular
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- SF = Stereotactic and Functional
- SP = Spine and Peripheral Nerves
- TR = Neurotrauma
- TU = Tumor

TU

T23 Malignant Gliomas: Advances in Surgery and Adjuvant Therapy

MODERATOR: E. Antonio Chiocca
FACULTY: Jeffrey N. Bruce, Costas G. Hadjipanayis, Ricardo J. Komotar, Linda M. Liau, Emmy Nkusi, Ian F. Parney
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe multidisciplinary approaches to treating malignant gliomas.
- Discuss recent guidelines for managing malignant gliomas.
- Outline patient-specific approaches to treating malignant gliomas.

SANS ANNUAL MEETING — *SANS supplemental exam is available for an additional $15.*

AP TR

T24 Managing ICP in the Trauma Patient

MODERATOR: Ryan S. Kitagawa
FACULTY: Jamshid Ghajar, Martin C. Holland, Gregory J. Murad, Raj K. Narayan
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss the utility of multimodal monitoring in the management of patients with elevated ICP.
- Review the non-surgical interventions such as hyperosmolar therapy and perfusion augmentation.
- Analyze the data for surgical decompression of intracranial hypertension.

AP TU

T25 Meningioma: Management Strategies

MODERATOR: Michael W. McDermott
FACULTY: Ossama Al-Mefty, Ian F. Dunn, Randy L. Jensen, Mark E. Linskey
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the treatment strategies and techniques for patients with meningioma.
- Discuss the epidemiology and natural history of meningioma.
- Summarize the differences in treatment strategy based on anatomic location.

TU

T26 Laser Interstitial Thermal Therapy for Brain Tumors

MODERATOR: Andrew E. Sloan
FACULTY: Clark C. Chen, Steven N. Kalkanis, Eric C. Leuthardt
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the expanded indications and new approaches for LITT.
- Discuss the advantages and disadvantages of LITT for brain tumors.
- Apply these patient selection and surgical techniques in their management of brain tumors.

SE

T27 Using Outcome Data to Work with Hospital Administration on Appropriate Quality Metrics

MODERATORS: Joshua J. Chern, Sandi Lam
FACULTY: William A. Friedman, Raymond D. Turner
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss techniques and approaches for interacting with hospital administration to optimize quality metrics.
- Identify relevant national databases that can be utilized for establishing hospital standards.

1:45-2:45 pm

VISIT THE EXHIBIT HALL FOR A BEVERAGE BREAK & LIVE SURGERY

Endoscopic and Endoscopic Assisted Skull Base Surgery
Faculty: Paul Gardner

STORZ KARL STORZ ENDOSCOPY · KLS martin GROUP · stryker

1:45-2:45 PM

CNS RESIDENT SANS CHALLENGE CHAMPIONSHIP ROUND

2:00-2:45 PM

ANNUAL BUSINESS MEETING

Please plan to attend the Annual Business Meeting to hear an update on CNS business from the past year. CNS members will have the opportunity to vote on any proposed Bylaws amendments.

AFTERNOON SESSIONS

SECTION SESSIONS

SE 2:45–4:15 pm

Council of State Neurosurgical Societies

MODERATORS: Sabih T. Effendi, Sharon W. Webb
SPEAKER: Fernando Diaz
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Review several challenges facing the neurosurgical community in the time of health system consolidation.
- Discuss areas that they can work on making a difference for their future practice.
- Analyze the findings of novel neurosurgical studies and critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.

2:45–3:27 pm
Oral Abstract Presentations
See pages 64-65 for Oral Papers 159-165.

3:27–4:15 pm
Surviving Health System Consolidation for the Hospital-employed and the Independent Neurosurgeon
Fernando Diaz

CV 2:45–4:15 pm

Section on Cerebrovascular Surgery

MODERATORS: Amir R. Dehdashti, Chad Washington, Babu G. Welch
SPEAKER: Basant K. Misra
LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*

- Review studies comparing clipping to coiling.
- Identify unique socio-economic factors in other environments that affect choosing between clipping and coiling.
- Compare aneurysm treatment algorithms in the United States and India.
- Analyze the findings of novel neurosurgical studies and critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.

2:45–3:15 pm
Oral Abstract Presentations
See page 65 for Oral Papers 166-170.

3:15–3:45 pm
Trends in Aneurysm Treatment in India
Basant K. Misra

3:45–3:50 pm
Introduction of the Inaugural L. Nelson Hopkins Lecturer
Elad I. Levy

3:50–4:15 pm
Inaugural L. Nelson Hopkins Lecture
L. Nelson Hopkins

SP 2:45–4:15 pm

Section on Disorders of the Spine and Peripheral Nerves

MODERATORS: Mohamad Bydon, Christopher I. Shaffrey
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Analyze the findings of novel neurosurgical studies and critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify important ongoing clinical trials.
- Apply lessons from areas of active clinical research to their management of spinal disease patients.

2:45–4:15 pm
Oral Abstract Presentations
See pages 65-66 for Oral Papers 171-185.

TR 2:45–4:15 pm

Section on Neurotrauma and Critical Care

MODERATORS: Craig H. Rabb, Odette Harris
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Analyze the findings of novel neurosurgical studies, and critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify important ongoing clinical trials.
- Apply lessons from areas of active clinical research to their management of spinal disease patients.

2:45–4:15 pm
Oral Abstract Presentations
See pages 66-67 for Oral Papers 186-200.

PA 2:45–4:15 pm

Section on Pain

MODERATORS: Jeffrey E. Arle, Ashwin Viswanathan
SPEAKER: Brian J. Wainger
LEARNING OBJECTIVES: *Upon completion of this session, participants will be able to:*

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

2:45–3:27 pm
Mechanisms of Pain

2:45–3:05 pm
Mechanisms of Physiological and Pathological Pain
Brian J. Wainger

3:05–3:27 pm
Questions and Discussion

3:27–4:15 pm
Oral Presentations
See page 67 for Oral Papers 201-206.

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- AP = Advanced Practice Provider
- CV = Cerebrovascular
- GE = General
- PA = Pain
- PE = Pediatric
- RE = Resident
- SE = Socioeconomic
- SF = Stereotactic and Functional
- SP = Spine and Peripheral Nerves
- TR = Neurotrauma
- TU = Tumor

PE 2:45–4:15 pm

Section on Pediatric Neurological Surgery

MODERATORS: Lissa C. Baird, Brandon G. Rocque
SPEAKERS: Lissa C. Baird, Gregory G. Heuer, Paul Klimo, Catherine A. Mazzola, Mandeep S. Tamber, William E. Whitehead
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.
- Discuss the risks and benefits of fetal myelomeningocele closure and identify the key data important for parental consultation discussions.
- Review the evidence for long-term outcomes after fetal myelomeningocele closures and discuss the current practice for monitoring patient progress.
- Identify the key guideline updates from the pediatric neurosurgery guidelines committee and review future directions for guideline creation.

2:45–3:15 pm
Oral Abstract Presentations
See pages 67-68 for Oral Papers 209-213.

3:15–3:30 pm
Pediatric Guidelines Update: Plagiocephaly (Published) and Spina Bifida (In Process)
Lissa C. Baird, Paul Klimo, Catherine A. Mazzola, Mandeep S. Tamber

3:30–3:50 pm
Update on Long-term Outcomes from the MOMS Trial, Review of the Evidence
Gregory G. Heuer

3:50–4:10 pm
Putting the Evidence in Context: Counseling Parents About Fetal MMC Surgery
William E. Whitehead

4:10–4:15 pm
Questions and Discussion

SF 2:45–4:15 pm

Section on Stereotactic and Functional Neurosurgery

MODERATORS: Aviva Abosch, Julie G. Pilitsis
SPEAKERS: Ron L. Alterman, Paresh Doshi, W. Jeffrey Elias
LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*

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

2:45–3:30 pm
Surgical Approaches for Movement Disorders

2:45–3:00 pm
Open-loop Deep Brain Stimulation
Ron L. Alterman

3:00–3:15 pm
High-intensity MR-guided Focused Ultrasound
W. Jeffrey Elias

3:15–3:30 pm
Radiofrequency Lesioning
Paresh Doshi

3:30–4:15 pm
Oral Abstract Presentations
See pages 67-68 for Oral Papers 214-221.

TU 2:45–4:15 pm

Section on Tumors

MODERATORS: Maryam Rahman, Adam M. Robin
SPEAKERS: Frederick F. Lang, Keith L. Ligon, David N. Louis
LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*

- Define "integrated diagnosis," and identify the major changes in the WHO 2016 classification update and the potential clinical implications.
- Review the molecular sub-classification of glioma and/or medulloblastoma, and the purported impact on survival/tumor biology and common predictive and prognostic molecular markers in neuro-oncology.
- Analyze the findings of novel neurosurgical studies, and critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials studying targeted therapies for primary brain tumors.

2:45–3:30 pm
Primary Brain Tumors—New WHO Classification for Gliomas

2:45–3:00 pm
Overview of New WHO Classification for Gliomas
Keith L. Ligon

3:00–3:15 pm
Molecular Classification: Prognostic or Predictive?
David N. Louis

3:15–3:30 pm
Targeted Therapies for Primary Brain Tumors: Current Clinical Trials
Frederick F. Lang

3:30–4:12 pm
Oral Abstract Presentations
See page 68 for Oral Papers 222-228.

4:12–4:15 pm
Questions and Discussion

AFTERNOON SESSIONS

NEW! CASE-BASED DISCUSSION SESSIONS

Faculty will present cases to be examined, discussed, and debated by both the audience and the panel. Registered attendees are encouraged to submit cases for consideration prior to the course. **Visit cns.org/2017 for details.**

CV 4:15–6:15 pm

Case-based Discussion Session—AVMs/Dural Arteriovenous Fistulas

MODERATOR: Scott D. Simon
FACULTY: L. Dade Lunsford, Cameron G. McDougall, Gary K. Steinberg
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss various treatment options for AVMs and dural arteriovenous fistulas.
- Describe common complications in surgery for AVMs and dural arteriovenous fistulas.
- Strategize how to identify and avoid complications in surgery for AVMs and dural arteriovenous fistulas.

SP 4:15–6:15 pm

Case-based Discussion Session—Adult Degenerative and Deformity

MODERATOR: Peter D. Angevine
FACULTY: Richard G. Fessler, Regis W. Haid, Tyler R. Koski, Paul Park
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

SP 4:15–6:15 pm

Case-based Discussion Session—Thoracolumbar Spine

MODERATOR: James S. Harrop
FACULTY: Paul M. Arnold, Jennifer S. Kang, Manish K. Kasliwal, Wilson Z. Ray
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

6:15-7:15 PM

RESIDENT RECRUITMENT SOCIAL

Two or three years from completing residency? Seize the opportunity to meet potential future colleagues, recruiters, and new friends.

TR SP 4:15–6:15 pm

Case-based Discussion Session—Revision Spinal Surgery or Neuromodulation

MODERATORS: Sean J. Nagel, Michael P. Steinmetz
FACULTY: Shekar N. Kurpad, Robert M. Levy, Julie G. Pilitsis, Daniel K. Resnick, Konstantin V. Slavin, Khoi Duc Than
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss various treatment options for revision spinal surgery or neuromodulation.
- Describe common complications in revision spinal surgery or neuromodulation.
- Strategize how to identify and avoid complications in revision spinal surgery or neuromodulation.

PE 4:15–6:15 pm

Case-based Discussion Session—Management in Pediatric Athletes

MODERATOR: Edward R. Smith
FACULTY: Lance S. Governale, Mari Groves, Andrew Jea, Christina M. Sayama
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss various treatment options for the surgical management of pediatric athletes.
- Describe common complications for the surgical management of pediatric athletes.
- Strategize how to identify and avoid complications for the surgical management of pediatric athletes.

SF 4:15–6:15 pm

Case-based Discussion Session—Stereotactic and Functional

MODERATOR: Peter Konrad
FACULTY: Rees Cosgrove, Jean-Philippe Langevin, Andre Machado, Joseph S. Neimat, Francisco A. Ponce
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

TU 4:15–6:15 pm

Case-based Discussion Session—Brain Metastasis

MODERATOR: Jeffrey J. Olson
FACULTY: David W. Andrews, Gene H. Barnett, Veronica Chiang, William T. Curry, Ronald E. Warnick
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

DINNER SEMINAR 4

Complimentary shuttle service will be provided for all dinner seminars. Shuttles will depart from the Westin Boston Waterfront Hotel.

TU
OCT 10

GE 7:30–9:30 pm

Fee: $190 (includes three-course dinner and beverage)

DIN4 Global Neurosurgery

MODERATOR: Benjamin C. Warf
FACULTY: Robert J. Dempsey, Deepak K. Gupta, Michael M. Haglund, Peter Nakaji
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss challenges and successes experienced by surgeons involved in international neurosurgical work.
- Identify opportunities and needs in the global community for neurosurgical education and clinical care.

Empire

Located in the heart of Fan Pier in the Seaport District, Empire Restaurant & Lounge transports you into the mystics of Asia. This sleek, modern space is designed to give guests an old-world feel with a touch of Hong Kong mystery. Empire's extensive menu is a vibrant array of Asian favorites and delicacies, ranging from the innovative and new to the beloved and traditional.

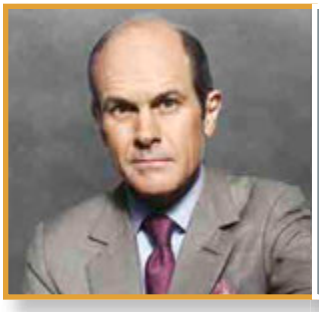
Zagat: *Boston's Best Asian Restaurants*

WE OCT 11

PROGRAM HIGHLIGHTS

7:00-8:30 AM

RAPID-EXCHANGE ORAL PRESENTATIONS



9:15-9:45 AM

SPECIAL LECTURE

Humans are Underrated—Building the New High-level Skills

Geoff Colvin

10:47-11:12 AM

SPECIAL LECTURE

Kathy McGroddy Goetz

11:16-11:41 AM

SPECIAL LECTURE

Peak Performance: The Making of An Expert Performer

Anders Ericsson

2:45-4:15 PM

SYMPOSIUM 4

Big Data

RAPID-EXCHANGE ORAL PRESENTATIONS

GE 7:00–8:30 am

Rapid-exchange Oral Presentations 2

MODERATORS: Krystal L. Tomei, Ben Waldau

Rapid-exchange Oral Presentations 3

MODERATORS: Kyle M. Fargen, Raul Vasquez-Castellanos

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

- Analyze the findings of novel neurosurgical studies, and critique the design and methodology.
- List important areas for further knowledge development and research.
- Identify the most important ongoing clinical trials.
- Apply lessons of ongoing research to neurosurgical care of patients.

FULL DETAILS ON PAGES 69-73.

GENERAL SCIENTIFIC SESSION IV

GE 8:45 am–12:15 pm

General Scientific Session IV

PRESIDING OFFICER: Gerald A. Grant
MODERATORS: Alexander A. Khalessi, Henry H. Woo
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify examples of paths of change.
- Discuss how paths of change are affecting/changing health care and neurosurgery.
- Apply strategies for adapting to paths of change.

8:45–8:53 am

Opening Remarks
Alan M. Scarrow

8:53–9:13 am
HONORED GUEST

Curiosity
Alan R. Cohen

9:13–9:15 am
Introduction of Geoff Colvin
Alexander A. Khalessi

9:15–9:45 am
SPECIAL LECTURE

Humans are Underrated—Building the New High-level Skills
Geoff Colvin
Book signing at the CNS Member Service Booth in the Exhibit Hall immediately following his presentation.

9:45–10:45 am
VISIT THE EXHIBIT HALL FOR A BEVERAGE BREAK & LIVE SURGERY

10:45–10:47 am
Introduction of Kathy McGroddy Goetz
Henry H. Woo

10:47–11:12 am
SPECIAL LECTURE

Kathy McGroddy Goetz

11:12–11:14 am
Announcement of Top Posters
Alexander A. Khalessi

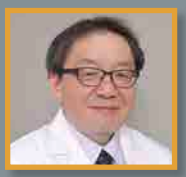
11:14–11:16 am
Introduction of Anders Ericsson
Gerald G. Grant

11:16–11:41 am
SPECIAL LECTURE

Peak Performance: The Making of an Expert Performer
Anders Ericsson

11:41–11:43 am
Introduction of the Japanese CNS President
Shekar N. Kurpad

11:43–11:50 am
JAPANESE CNS PRESIDENTIAL ADDRESS



Clinical Trials for Malignant Brain Tumors in Japan
Yoshitaka Narita

11:50–11:52 am
Announcement of SANS Resident Challenge Winner
Nader A. Pouratian

11:52–11:54 am
Introduction of Brain Tumor Guha Award
Steven N. Kalkanis

11:54 am–12:04 pm
Brain Tumor Guha Award
Frederick F. Lang

12:04–12:10 pm
***Neurosurgery* Pain Paper of the Year**

12:10–12:16 pm
***Neurosurgery* Stereotactic and Functional Neurosurgery Paper of the Year**

WE OCT 11 LUNCHEON SEMINARS

12:15–1:45 pm

All Luncheon Seminars include a plated lunch served in the seminar room.
Luncheon Seminar fee is $95 each ($75 for residents, fellows, medical students, and advance practice providers).

GE

W28 How to Onboard New Partners

MODERATOR: Gary R. Simonds
FACULTY: Kevin M. Cockroft, Michel Lacroix
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Review different practice settings and how this may affect new partners from the start as well as other partners in practice.
- Describe some of the different demands that make the onboarding of new partners challenging.
- Return to their practices with a bundle of possible ways to optimize the onboarding of new partners.

CV

W29 Flow Diversion and Intra-saccular Devices: An Update

MODERATOR: Adam S. Arthur
FACULTY: Alexander L. Coon, Ricardo A. Hanel, Raymond D. Turner, Ajay K. Wakhloo
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Assess indications for flow diversion based on literature review.
- Discuss operative techniques and special considerations in relation to flow diversion.
- Identify prevention and complication management strategies for such procedures.

CV

W30 Venous Stenting for Pseudotumor

MODERATOR: Felipe Albuquerque
FACULTY: Mohammad A. Aziz-Sultan, Robert F. James, Kenneth C. Liu, Kenneth V. Snyder
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Explain the physiology of venous stenosis and intracranial pressure.
- Explain how stenting can improve papilledema but is unlikely to help headaches.
- Distinguish between arterial and venous stenting and what unique tools are required for each.

TU

W31 Intra-arterial Therapies for Tumors

MODERATOR: Pascal Jabbour
FACULTY: William J. Mack, Jeffrey S. Pannell, Aman B. Patel, Adnan H. Siddiqui
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss applications of intra-arterial techniques for management of neurosurgical pathology.
- Discuss operative techniques and special consideration for intra-arterial therapies for tumors.
- Identify prevention and complication management strategies for such procedures.

PA

W32 SCS-evidence and Expertise

MODERATOR: Erika A. Petersen
FACULTY: Ellen L. Air, Richard B. North, Francisco A. Ponce, Alexander S. Taghva
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

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

AP PE TR

W33 Pediatric Head Trauma

MODERATOR: Mark R. Proctor
FACULTY: Gerald A. Grant, Lauren F. Schwartz, Krystal L. Tomei
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify unique challenges in pediatric patients who suffer head trauma.
- Outline the strategies for managing pediatric head trauma.
- Assess current practice standards and practical issues surrounding management of pediatric patients with head injury.

RE SP

W34 Complication Management in Spine Surgery

MODERATOR: Gregory R. Trost
FACULTY: Paul M. Arnold, John Chi, Bhawani S. Sharma, William C. Welch
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify and avoid complications commonly encountered in spine surgery.
- Discuss the role of complication avoidance in the delivery of quality health care.
- Incorporate techniques of complication avoidance into clinical practice.

TU

W35 Non-functioning Pituitary Adenomas: Operative Nuances and Management

MODERATOR: Theodore H. Schwartz
FACULTY: Deepu Banerji, James P. Chandler, Manuel Ferreira, Pamela Stuart Jones, Nelson M. Oyesiku
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Outline the roles of medical, radiation, and surgical treatment of non-secretory pituitary adenomas.
- Explain the surgical nuances of pituitary resection.
- Discuss the guidelines for non-functioning pituitary adenoma management.

1:45-2:45 pm
VISIT THE EXHIBIT HALL FOR A BEVERAGE BREAK

SUBSPECIALTY SESSION TRACK KEY

- AP = Advanced Practice Provider
- CV = Cerebrovascular
- GE = General
- PA = Pain
- PE = Pediatric
- RE = Resident
- SE = Socioeconomic
- SF = Stereotactic and Functional
- SP = Spine and Peripheral Nerves
- TR = Neurotrauma
- TU = Tumor

RE TU

W36 Cutting-edge Management of Brain Metastasis

MODERATORS: Gene H. Barnett, Daniel P. Cahill
FACULTY: Ekkehard M. Kasper, Sujit S. Prabhu, Patrick Wen
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Describe the multiple approaches for management of brain metastases.
- Discuss the advantages and disadvantages of various treatment options.
- Discuss the guidelines for brain metastasis management.

SANS ANNUAL MEETING *SANS supplemental exam is available for an additional $15.*

AP TU

W37 Acoustic Neuromas: Current Management Strategies

MODERATOR: Steven L. Giannotta
FACULTY: Carl B. Heilman, Michael J. Link, Jay Loeffler, Michael McKenna, Suresh Nair, Varindera P. Singh
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Discuss complication management and avoidance in surgery for acoustic neuroma.
- Outline the diagnostic workup for a patient with acoustic neuroma.
- Describe the treatment strategies for acoustic neuroma.

GE RE

W38 From Residency to Practice and Beyond: Getting the Job that is Right for You

MODERATOR: Ben Waldau
FACULTY: Robert A. Hirschl, Pamela Stuart Jones, Shahid Mehdi Nimjee, William R. Stetler
LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*

- Identify factors important to consider when beginning a job search.
- Discuss pitfalls to avoid when evaluating job prospects and negotiating a contract.
- Apply these strategies in retaining neurosurgical employment.

GE

W39 Surgery, Research, and Innovation: Lessons Learned from my Mentor

MODERATOR: Isabelle M. Germano
FACULTY: Deborah L. Benzil, Richard G. Ellenbogen, Elad I. Levy, Susan C. Pannullo, Shanandoah Robinson, Uzma Samadani
LEARNING OBJECTIVES: *Upon completion of the course, participants will be able to:*

- Review successful strategies in surgery, research, and innovation.
- Identify unsuccessful strategies in surgery, research, and innovation.
- Discuss the requirements of a mentor-mentee relationship and how to foster this.

SYMPOSIUM 4

AP GE RE 2:45–4:15 pm

SYM4 Big Data

MODERATORS: Lola Blackwell Chambless, Eric K. Oermann
SPEAKERS: Mohamad Bydon, Jason Davies, Leonard D'Avolio, Nicholas F. Marko, Scott L. Parker, Matthew Russell
COURSE DESCRIPTION: In this session, we explore one of the most compelling questions facing the neurosurgical community in 2017: How will we use "Big Data" to enhance our understanding of neurosurgical disease? Leading neurosurgeons will join content experts from outside the field to discuss modern data science strategies and their potential applications. Covering wide-ranging topics from genomics to health care delivery, this session will provide a critical foundation for any neurosurgeon looking to understand the future of outcomes research.
LEARNING OBJECTIVES: *Upon completion of this course, attendees will be able to:*

- Identify opportunities to enhance neurosurgical research through use of large datasets.
- Compare methods of statistical analyses, contrasting their strengths and weaknesses.
- Discuss the limitations of current neurosurgical databases.

2:45–3:05 pm
Medicine's Next Great Breakthrough
Leonard D'Avolio

3:05–3:10 pm
Questions and Discussion

3:10–3:20 pm
N2QOD: Lessons Learned from Neurosurgery's First Foray into Big Data
Mohamad Bydon

3:20–3:30 pm
Data Science and Genomics
Nicholas F. Marko

3:30–3:40 pm
Embracing Data in Clinical Practice
Jason Davies

3:40–3:50 pm
Developing a Data-driven Research Program: A Roadmap for Neurosurgeons
Scott L. Parker

3:50–3:55 pm
Questions and Discussion

3:55–4:15 pm
Health Care Providers and the Data Science Industry: The Future of Collaboration
Matthew Russell

ABSTRACTS/ORAL PRESENTATIONS

MO OCT 9 COUNCIL OF STATE NEUROSURGICAL SOCIETIES ORAL PRESENTATIONS

3:27–3:33 pm
JULIUS GOODMAN RESIDENT AWARD
109 Impact of a More Restrictive Overlapping Surgery Policy: An Analysis of Complication Rates, Resident Involvement, and Surgical Wait Times at a High-volume Neurosurgical Department
Jian Guan, Michael Karsky, Andrea A. Brock, William T. Couldwell, John R. Kestle, Randy L. Jensen, Andrew T. Dailey, Richard Schmidt

3:33–3:39 pm
SAMUEL HASSENBUSCH YOUNG NEUROSURGEON AWARD
110 Neurosurgery Morning Huddle Reduces Costs and Increases Patient Satisfaction
Alvin Chan, Sumeet Vadera

3:39–3:45 pm
111 Misaligned Incentives for Lumbar Spine Surgery in the Bundled Payment for Care Initiative
Joseph E. Tanenbaum, Dominic Pelle, Edward C. Benzel, Michael P. Steinmetz, Thomas Mroz

3:45–3:51 pm
112 Trends in Physician Reimbursement in Spine Surgery Since the Affordable Care Act
Joshua Meyers, Jason Davies, John Pollina, Jr.

3:51–3:57 pm
113 Testing the Efficacy of Simulation in Neurosurgical Education: First Results of the SENSE Trial
A. Nimer Amr, Michael Kosterhon, Eleftherios Archavlis, Florian Ringel, Alexander L. Green

3:57–4:03 pm
114 Allowing Overlapping Surgery Decreases Length of Stay in an Academic, Safety-net Hospital
Anthony M. DiGiorgio, Praveen V. Mummaneni, Jonathan L. Fisher, Adam Podet, Clifford Crutcher, Michael S. Virk, Jason D. Wilson, Gabriel C. Tender

4:03–4:09 pm
115 Variation in Payments for Spine Surgery Episodes of Care: Implications for Episode-based Bundled Payment
Elyne N. Kahn, Chandy Ellimoottil, James M. Dupree, Paul Park, Andrew M. Ryan

4:09–4:15 pm
116 Navigating Risk in a Capitated or Bundled Payment Model for Spine Surgery: Introduction of the Carolina-Semmes Prediction Tool
Matthew J. McGirt, Scott L. Parker, Silky Chotai, Deborah Pfortmiller, Jeffrey M. Sorenson, Kevin T. Foley, Anthony L. Asher

MO OCT 9 SECTION ON CEREBROVASCULAR SURGERY ORAL PRESENTATIONS

2:45–2:51 pm
GALBRAITH AWARD
117 Effects of Different Surgical Modalities on Clinical Outcome of Moyamoya Disease: A Prospective Cohort Study
Xiaofeng Deng, Dong Zhang, Yan Zhang, Rong Wang, Faliang Gao, Jizong Zhao

2:51–2:57 pm
118 Lessons Learned After 500 Cases of Intra-arterial Chemotherapy for Retinoblastoma
Elias Atallah, Stavropoula I. Tjoumakaris, Robert H. Rosenwasser, Pascal Jabbour

2:57–3:03 pm
119 Visualization of Vascular Structures of the Brain Through a Novel Multispectral Fluorescence Microscope After Intravenous Application of ICG
Dimitrios Athanasopoulos

3:03–3:09 pm
120 Rates of Re-hemorrhage, Risk Factors, and Outcomes of Previously Ruptured Arteriovenous Malformations (AVMs)
Justin M. Caplan, Wuyang Yang, Tomas Garzon-Muvdi, Geoffrey P. Colby, Alexander L. Coon, Rafael J. Tamargo, Judy Huang

3:09–3:15 pm
121 Endovascular Thrombectomy Alone Versus Combined Intravenous Thrombolysis and Thrombectomy: A Systematic Review and Meta-analysis
Kevin Phan, Adam Dmytriw, Christoph J. Griessenauer, Justin M. Moore, Christopher S. Ogilvy, Ajith J. Thomas

3:15–3:21 pm
122 Significance of Fluctuations in Serum Sodium Levels Following Aneurysmal Subarachnoid Hemorrhage: An Exploratory Analysis
Matt E. Eagles, Michael K. Tso, R. Loch Macdonald

3:21–3:27 pm
123 Outcome Comparison for Single Versus Multiple Radiosurgery for Brain Arteriovenous Malformation (AVM): A Propensity-matched Cohort Analysis
Alice L. Hung, Wuyang Yang, Tomas Garzon-Muvdi, Justin M. Caplan, Geoffrey P. Colby, Alexander L. Coon, Rafael J. Tamargo, Judy Huang

3:27–3:33 pm
124 Repeat Stereotactic Radiosurgery for Incompletely Obliterated Arteriovenous Malformations: An International Multicenter Study
Hideyuki Kano, Nathaniel Sisterson, Dale Ding, Jason P. Sheehan, Roberto Martinez-Alvarez, Nuria Martinez-Moreno, Paul P. Huang, Amparo Wolf, Douglas Kondziolka, Inga S. Grills, Kevin Blas, David Mathieu, L. Dade Lunsford

3:33–3:39 pm
125 Staged Endovascular Treatment of Ruptured Intracranial Aneurysms: Acute Coiling Followed By Delayed Flow Diversion
Erick M. Westbroek, Matthew Bender, Narlin Beaty, Bowen Jiang, Risheng Xu, Jessica K. Campos, Rafael J. Tamargo, Judy Huang, Geoffrey P. Colby, Alexander L. Coon

3:39–3:45 pm
126 Aneurysm Residual Regrowth, Recurrence, and De Novo Aneurysm Formation After Microsurgical Clip Occlusion
Jan-karl Burkhardt, Michelle Hui Juan Chua, Miriam Weiss, Angelique Do, Ethan A. Winkler, Michael T. Lawton

MO OCT 9 SECTION ON PAIN ORAL PRESENTATIONS

3:33–3:40 pm
127 A Novel Scoring System for Preoperative Prediction for Pain-free Survival After Microsurgery for Trigeminal Neuralgia: TN-MVD Score
Frances Hardaway, Hanna Gustafsson, Katherine Holste, Kim J. Burchiel, Ahmed M. Raslan

3:40–3:47 pm
128 The Importance of Somatotopy to Achieve Clinical Benefit in Motor Cortex Stimulation for Pain Relief
Afif M. Afif

3:47–3:54 pm
129 Chronic Pain and Advanced MRI Techniques
Sharon M. Jay, Tracy Melzer, Deborah Snell

3:54–4:01 pm
130 Pain-free Survival After Microvascular Decompression and Sectioning of the Vagoglossopharyngeal Nerve Complex in Glossopharyngeal Neuralgia
Katherine Holste, Ahmed M. Raslan, Kim J. Burchiel

4:01–4:08 pm
131 Neonatal Treatment with Endogenous Repair Agents Reverses Abnormal Thermal Sensation in a Preclinical Model of Cerebral Palsy
Akosua Oppong, Fatu S. Conteh, Jessie Maxwell, Tracylyn Yellowhair, Lauren Jantzie, Shenandoah Robinson

4:08–4:15 pm
132 The Underlying Effect of Burst Stimulation on Chronic Pain Using Multimodal Neuroimaging—EEG, fMRI, and PET
Shaheen Ahmed, Sven Vanneste

MO OCT 9 SECTION ON PEDIATRIC NEUROLOGICAL SURGERY ORAL PRESENTATIONS

2:45–2:51 pm
134 Clinicopathological and Molecular Characteristics of Pediatric Versus Adult Meningiomas
Vaishali Suri, Sudha Battu, Sawan Kumar, Anupam Kumar, Pankaj Pathak, MC Sharma, Ashish Suri, Chitra Sarkar

2:51–2:57 pm
135 Pediatric Supratentorial Ependymoma: Clinical, Radiographic, and Molecular Analysis
Jock Lillard, Paul Klimo, Jr., Garrett T. Venable

2:57–3:03 pm
136 Long-term Supratentorial Radiographic Effects of Surgery and Local Radiation in Children with Infratenorial Ependymoma
Derek W. Yecies, Rogelio Esparza, Tej D. Azad, Jennifer L. Quon, Nils Forkert, Sarah Maceachern, Samuel H. Cheshier, Michael S. B. Edwards, Gerald A. Grant, Kristen Yeom

3:03–3:09 pm
137 Novel Genome-wide CRISPR Screen for Glioblastoma Invasion
Laura M. Prolo, Amy Li, David Morgens, Richard Reimer, Michael Bassik, Gerald A. Grant

3:09–3:15 pm
138 Endoscopic Endonasal Skull Base Surgery in Pediatric Patients and Impact on Midface Growth
Wendy Chen, Shih-Dun Liu, Barton F. Branstetter, Yue-Fang Chang, Lindsay A. Schuster, Paul A. Gardner

3:15–3:21 pm
139 Outcome of Stereotactic Laser Ablation of Primary Brain Tumors in Children
Jeffrey S. Raskin, Frank Lin, Murali Chintagumpala, Virendra R. Desai, Patrick J. Karas, Kathryn Wagner, Howard L. Weiner, Sandi Lam, Daniel Curry

3:21–3:27 pm
140 The Effect of Hospital Case-volume on Pediatric Patients with Resected Posterior Fossa Tumors
Annie I. Drapeau, David M. Kline, Adrienne Boczar, Julie Leonard, Jeffrey R. Leonard

3:27–3:33 pm
141 Natural History and Management of Incidentally Discovered Focal Brain Lesions of Uncertain Etiology in Children
Mohamed A. Zaazoue, Peter E. Manley, Kush Kapur, Nicole J. Ullrich, V. Michelle Silvera, Liliana Goumnerova

3:33–3:39 pm
142 Current Surgeon Opinions Concerning the Indications for Surgery in Metopic Craniosynostosis
Kavelin Rumalla, Usiakimi Igbaseimokumo

3:39–3:45 pm
143 Pediatric Trigeminal Neuralgia (TN): Results with Early Microvascular Decompression (MVD)
Mark E. Linskey

MO OCT 9 SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY ORAL PRESENTATIONS

3:33–3:39 pm
STEREOTACTIC AND FUNCTIONAL NEUROSURGERY RESIDENT AWARD
144 Prefrontal Neurons Modulate Motor Behavior by Targeting Distinct Mediolateral Cortical Sites
Benjamin L. Grannan, Wenhua Zhang, Songjun W. Li, Ziv Williams

3:39–3:45 pm
145 Tractography-defined Subregions of Human Nucleus Accumbens Predict Acute Anxiolytic Response to Selective Stimulation
Sam Cartmell, Qiyuan Tian, Nolan Williams, Kai Miller, Grant Yang, Jennifer McNab, Casey H. Halpern

3:45–3:51 pm
146 Prefrontal Cortical Connectivity-based Segmentation of the Anterior Limb of the Internal Capsule: Implications for Stereotactic Targeting for Refractory OCD
Pranav Nanda, Garrett P. Banks, Justin Oh, Yagna Pathak, Sameer A. Sheth

3:51–3:57 pm
147 Responsive Neurostimulation for Impulsivity: Evidence from a Mouse Model of Binge-eating Behavior
Hemmings Wu, Kai J. Miller, Zack Blumenfeld, Nolan Williams, Vinod K. Ravikumar, Karen Lee, Matthew Sacchet, Max Wintermark, Daniel Christoffel, Brian Rutt, Helen Bronte-Stewart, Brian Knutson, Robert C. Malenka, Casey H. Halpern

3:57–4:03 pm
148 Using Game Theory in Primates to Study Interactive Social Behavior and its Neural Modulation
Ziv Williams, Raymundo Báez Mendoza

4:03–4:09 pm
149 Human Subthalamic Nucleus Neurons Exhibit Increased Theta-band Phase-locking During High-conflict Decision Making
Sheng-Tzung Tsai, Todd M. Herrington, Shaun Patel, Kristen Kanoff, Alik S. Widge, Darin D. Dougherty, Emad N. Eskandar

4:09–4:15 pm
150 Effect of Stimulation Parameters on Visual Percepts Elicited by Stimulation of a Visual Cortical Prosthesis for the Blind
Soroush Niketeghad, Abirami Muralidharan, Uday Patel, Jessy Dorn, Robert Greenberg, Nader Pouratian

MO OCT 9 SECTION ON TUMORS ORAL PRESENTATIONS

3:30–3:36 pm
NATIONAL BRAIN TUMOR SOCIETY MAHALEY CLINICAL RESEARCH AWARD
151 TERT Promoter Mutations in Progressive Treatment-resistant Meningiomas
Tareq A. Juratli, Ganesh Shankar, Mara Koerner, Shilpa Tummala, Hiroaki Wakimoto, Dietmar Krex, Gabriele Schackert, Priscilla Brastianos, Matthias Kirsch, Daniel P. Cahill

3:36–3:42 pm
INTEGRA FOUNDATION AWARD
152 Complications Associated with Transsphenoidal Pituitary Surgery: Experience of 1,171 Consecutive Cases Treated at a Single Tertiary Care Pituitary Center
Matthew Agam, Michelle A. Wedemeyer, John D. Carmichael, Martin H. Weiss, Gabriel Zada

3:42–3:48 pm
BRAINLAB NEUROSURGERY AWARD
153 Prognostic Role of the Low Tri-Iodothyronine Syndrome in Brain Tumor Patients
Adomas Bunevicius, Sarunas Tamasauskas, Vytenis Deltuva, Edward R. Laws, Jr., Arimantas Tamasauskas

3:48–3:54 pm
STRYKER NEURO-ONCOLOGY AWARD
154 Genomic Landscape of Radiation-induced Meningiomas
Suganth Suppiah, Sameer Aghinotri, Pete Tonge, Yasin Mamatjan, Kenneth D. Aldape, Gelareh Zadeh

3:54–4:00 pm
AMERICAN BRAIN TUMOR ASSOCIATION YOUNG INVESTIGATOR AWARD
155 Topical Vancomycin Reduces Surgical-site Infections After Craniotomy: A Prospective, Controlled Study
Kalil G. Abdullah, Arka Mallela, Andrew Richardson, Timothy H. Lucas, II

4:00–4:06 pm
JOURNAL OF NEURO-ONCOLOGY AWARD
156 Small Terminal Deletions/Duplications and Alternative Lengthening of Telomeres are Co-occur in IDH Mutation-only Gliomas
Desmond A. Brown, Seiji Yamada, Thomas Kollmeyer, Paul Decker, Matthew L. Kosel, Gobinda Sarkar, Alissa Caron, Chandralekha Halder, Vanessa Y. Ruiz, Benjamin R. Kipp, Jesse S. Voss, Caterina Giannini, Robert Jenkins

4:06–4:12 pm
SYNTHES SKULL BASE SURGERY AWARD
157 Reinventing the Wheel: Intraoperative Continuous Flash Visual Evoked Potentials, a Novel Technique to Lessen Intraoperative Optic Nerves and Chiasmal Injury in Endoscopic Skull Base Surgery
Fahad A. Alkherayf, David Houlden, Chantal Turgeon, Charles B. Agbi, Andre Lamothe, Kristian Macdonald, Shaun Kilty

4:12–4:18 pm
158 Prognostic Significance of Silent Corticotroph Staining in Radiosurgery for Non-functioning Pituitary Adenomas: An International Multicenter Study
Jason P. Sheehan, Or Cohen-Inbar, Zhiyuan Xu, Cheng-Chia Lee, Danilo Silva, David Mathieu, Christopher P. Cifarelli, L. Dade Lunsford, Douglas Kondziolka

TU OCT 10 COUNCIL OF STATE NEUROSURGICAL SOCIETIES ORAL PRESENTATIONS

2:45–2:51 pm
159 Factors Associated with Postoperative Complications Following Transsphenoidal Surgery for Pituitary Tumor Resection from the National Surgical Quality Improvement Program (NSQIP)
Andrew K. Rock, Charles F. Opalak, Kathryn Workman, Matthew Carr, William C. Broaddus

2:51–2:57 pm
160 The Impact of the Dependent Coverage Provision on Neurosurgical Population
Matthew Decker, John D. Mayfield, Paul Kubilis, Maryam Rahman

2:57–3:03 pm
161 Direct Cost Analysis of 38 Cervical Spinal Deformity Operations Across Two Major Spinal Deformity Centers with Implications for Catastrophic Costs and 90-day Cost Bundles
Corinna C. Zygourakis, Justin K. Scheer, Seungwon Yoon, Samrat Yeramaneni, Richard A. Hostin, Jr., Michael F. O'Brien, Christopher I. Shaffrey, Justin S. Smith, Vedat Deviren, Christopher P. Ames

3:03–3:09 pm
162 Student Response to Undergraduate In-depth Exposure to Neurosurgery
Gary R. Simonds, Cara Rogers, Michael Benko, Chris Busch, Brendan Klein, Harald Sontheimer

3:09–3:15 pm
163 Analysis and Categorization of Complications Presented at a Neurosurgical Morbidity and Mortality Conference: A Prospective Study
Erinc Akture, Philipp Taussky

3:15–3:21 pm
164 Hispanic Ethnicity and Socioeconomic Status are Independently Associated with Improved Prognosis in Glioblastoma Patients
Kevin J. Moore, Angela Richardson, Tulay Koru-Sengul, Michael E. Ivan

3:21 – 3:27 pm
165 Institutional Review of Mortality in 5,434 Consecutive Neurosurgery Patients: Are We Improving?
Aladine A. Elsamadicy, Amanda Sergesketter, John H. Sampson, Oren N. Gottfried

TU OCT 10 SECTION ON CEREBROVASCULAR SURGERY ORAL PRESENTATIONS

2:45–2:51 pm
JOINT AANS/CNS CEREBROVASCULAR SECTION ABSTRACT AWARD
166 TLR-4-Regulated Cerebrospinal Fluid Hypersecretion in Post-hemorrhagic Hydrocephalus
Jason K. Karimy, Jinwei Zhang, David B. Kurland, Brianna C. Theriault, Daniel Duran, Charuta G. Furey, Volodymyr Gerzanich, J. Marc Simard, Kristopher T. Kahle

2:51–2:57 pm
167 High Throughput Metabolite Profiling Identifies Plasma Anandamide as a Biomarker of Functional Outcome After Aneurysmal Subarachnoid Hemorrhage
Christopher J. Stapleton, Hannah Irvine, Zoe Wolcott, Aman B. Patel, Jonathan Rosand, W. Taylor Kimberly

2:57–3:03 pm
168 Wall Enhancement in Unruptured Aneurysms is Associated with Symptomatic Presentation and Size
Branden J. Cord, Samuel A.C. Sommaruga, Ryan M. Hebert, Ajay Malhotra, Michelle H. Johnson, Frank J. Minja, Murat Gunel, Kevin Sheth, Guido Falcone, Charles C. Matouk

3:03–3:09 pm
169 Stereotactic Radiosurgery for Dural Arteriovenous Fistulas Without Cortical Venous Reflux
Daniel Tonetti, Bradley A. Gross, Brian T. Jankowitz, Kyle M. Atcheson, Hideyuki Kano, Edward A. Monaco, III, Ajay Niranjan, L. Dade Lunsford

3:09–3:15 pm
170 Vasa Vasorum Activities in Human Carotid Atherosclerosis is Associated with Plaque Development and Vulnerability
Sungpil Joo

TU OCT 10 SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES ORAL PRESENTATIONS

2:45–2:51 pm
171 Psychiatric Comorbidities—What to Expect Post-spine Surgery
Karthik Madhavan, Lee O. Chieng, Michael Y. Wang, Steven Vanni

2:51–2:57 pm
172 Additional Therapies to Surgery in Adult Patients with Malignant Peripheral Nerve Sheath Tumors (MPNSTs): Predictors and Survival Using the National Cancer Database
Edward N. Kankaka, Panagiotis Kerezoudis, Mohammed A. Alvi, Yu Jui-Tsen, Jenna Meyer, Sandy Goncalves, Mohamad Bydon

2:57–3:03 pm
173 EVOLVE—Significant Improvements in Pain, Disability, Quality of Life, and Overall Health with Use of Balloon Kyphoplasty for Vertebral Compression Fractures in Medicare-eligible Patients Despite Minimal Improvements in Vertebral Body Height
John Amburgy, Douglas Beall, Richard Easton, Douglas Linville, Sanjay Talati, Bradly Goodman, Devin Datta, John Webb, Melissa R. Chambers

3:03–3:09 pm
174 Comparison of 7-year Results of One-level Versus Two-level Cervical Disc Arthroplasty and Fusion
Todd H. Lanman

3:09–3:15 pm
175 Risk Factors and Clinical Impact of Perioperative Neurological Deficits Following Thoracolumbar Arthrodesis: National Inpatient Sample Analysis
Enyinna L. Nwachuku, Amol Mehta, Nima Alan, James Zhou, David O. Okonkwo, Adam S. Kanter, D. Kojo Hamilton, Parthasarathy D. Thirumala

3:15–3:21 pm
176 Efficiency of Spinal Anesthesia in Comparison to General Anesthesia in Lumbar Spine Surgery: A Retrospective Analysis of 544 Patients
John T. Pierce, Prateek Agarwal, Paul J. Marcotte, William C. Welch

3:21–3:27 pm
177 The Relationship Between MRI Signal Intensity Changes, Clinical Presentation, and Surgical Outcome in Degenerative Cervical Myelopathy: Analysis of a Global Cohort
Aria Nouri, Allan R. Martin, So Kato, Hamed Reihani-Kermani, Lauren Riehm, Michael G. Fehlings

3:27–3:33 pm
178 Hybrid Surgery-radiosurgery Therapy for Metastatic Epidural Spinal Cord Compression (MESCC): A Prospective Evaluation Using Patient-reported Outcomes
Ori Barzilai, Mary Kate Amato, Lily McLaughlin, Anne Reiner, Shahiba Ogilvie, Eric Lis, Yoshiya J. Yamada, Mark H. Bilsky, Ilya Laufer

3:33–3:39 pm
179 Patients Over Age 65 with Postoperative Malalignment are Not as Disabled as Younger Patients
Kai-Ming G. Fu, Pierce D. Nunley, Gregory M. Mundis, Jr., Paul Park, Stacie Nguyen, Frank La Marca, Juan S. Uribe, Robert Eastlack, Khoi Duc Than, David O. Okonkwo, Adam S. Kanter, Neel Anand, Richard G. Fessler, Praveen V. Mummaneni, International Spine Study Group

3:39–3:45 pm
180 Long-term Outcomes of Arthroplasty for Cervical Myelopathy Versus Radiculopathy, and Arthroplasty Versus Arthrodesis for Cervical Myelopathy
Jeffrey McConnell, Matthew F. Gornet, K. Daniel Riew, Todd H. Lanman, J. Kenneth Burkus, Scott Hodges, Randall Dryer

3:45–3:51 pm
181 Comparing the Efficacy of Long Segment Subaxial Cervical Fixation Ending at Either C7 or the Upper Thoracic Spine in the Treatment of Cervical Degenerative Disease
Chengmin Zhang, Paul M. Arnold, Qiang Zhou

3:51–3:57 pm
182 Posterior Micro-endoscopic Discectomy Versus ACDF for Single-level Radiculopathy: Comparative Effectiveness and Cost-utility Analysis
Matthew J. McGirt, E. Hunter Dyer, Domagoj Coric, Silky Chotai, Anthony L. Asher, Tim E. Adamson

3:57–4:03 pm
183 Short Segment Posterior Fixation with Index Level Screws Versus Long Segment Posterior Fixation for Thoracolumbar Spine Fracture: Angle of Correction and Pain
Ahmed M. Sallam

4:03–4:09 pm
184 Effect of Cervical Deformity Correction on Spinal Cord Volume and Stenosis
Peter G. Passias, Gregory W. Poorman, Charless Wang, Themistocles Protopsaltis, Christopher I. Shaffrey, Robert Hart, Virginie Lafage, Bassel G. Diebo, Justin S. Smith, Samantha R. Horn, Muhammed B. Janjua, Christopher P. Ames, Renaud Lafage, Han Jo Kim, International Spine Study Group (ISSG)

4:09–4:15 pm
185 The Prevalence of Undiagnosed Pre-surgical Cognitive Impairment and Its Post-surgical Clinical Impact in Elderly Patients Undergoing Surgery for Adult Spinal Deformity
Owoicho Adogwa, Aladine A. Elsamadicy, Emily Lydon, Victoria Vuong, Joseph S. Cheng, Isaac O. Karikari, Carlos A. Bagley

TU OCT 10 SECTION ON NEUROTRAUMA AND CRITICAL CARE ORAL PRESENTATIONS

2:45–2:51 pm
186 Predicting the Requirement for Intracranial Pressure Monitoring in Pediatric Traumatic Brain Injury
Saeed Kayhanian, Adam M.H. Young, Ross Ewen, Rory Piper, Mathew R. Guilfoyle, Joseph Donnelly, Helen M. Fernandes, Matthew Garnett, Peter Smielewski, Marek Czosnyka, Shruti Agrawal, Peter J. Hutchinson

2:51–2:57 pm
187 Early Post-traumatic Seizures are Associated with Valproic Acid Plasma Concentrations and UGT1A6/CYP2C9 Genetic Polymorphisms in Patients with Severe Traumatic Brain Injury
Yirui Sun, Jian Yu, Qiang Yuan, Jin Hu

2:57–3:03 pm
188 Predicting Post-traumatic Hydrocephalus: Derivation and Validation of a Risk Scoring System Based on Clinical Characteristics
Hao Chen

3:03–3:09 pm
189 Elevated Inflammation and Decreased Platelet Activity is Associated with Poor Outcomes After Traumatic Brain Injury
Cole T. Lewis, Jude P. Savarraj, Mary F. McGuire, H. Alex Choi, Ryan S. Kitagawa

3:09–3:15 pm
190 Time Course and Physiological Determinants of Cerebral Lactate/Pyruvate Ratio Following Traumatic Brain Injury
Mathew R. Guilfoyle, Ivan Timofeev, Adel Helmy, Keri Carpenter, David K. Menon, Peter Smielewski, Marek Czosnyka, Peter J. Hutchinson

3:15–3:21 pm
192 Craniotomy for Acute Subdural Hematoma—Outcomes in Patients Over 70 Years
Daniel R. Monsivais, Alexandra Fonseca, Ryan S. Kitagawa, Davis So, Melisa French, Chunyan Cai

3:21–3:27 pm
193 Does Stem Cell Therapy Hold Promise in the Management of Traumatic Brain Injuries? A Literature Review of Animal Studies
Ayaz M. Khawaja, Maira Mirza, Gabriel Rodriguez, Hassan Aziz

3:27–3:33 pm
194 Endoscopic-assisted Evacuation of Chronic Subdural Hematoma: A Paradigm Shift or a Waste of Time?
Netanel Benshalom, Sagi Harnof, Uzi B. David

3:33–3:39 PM
195 Chronic Traumatic Encephalopathy (CTE): Clinical and Pathological Insights
Domenic P. Esposito

3:39–3:45 pm
196 Meta-analysis of the Effect of Intracranial Infections on Morbidity and Mortality of Civilian Craniocerebral Gunshot Injuries
Georgios Maragkos, Katharine M. Cronk, Efstathios Papavassiliou, James W. Holsapple, Aristotelis Filippidis

3:45–3:51 pm
197 The Relative Odds of Sustaining a Sport-related Concussion: A Study of 12,320 Student-athletes
Benjamin L. Brett, Andrew W. Kuhn, Aaron M. Yengo-Kahn, Gary Solomon, Scott L. Zuckerman

3:51–3:57 pm
198 Outcomes Following Exploratory Burr Holes for Traumatic Brain Injury in a Resource-poor Setting
Jessica C. Eaton, Asma Bilal Hanif, Gift Mulima, Chifundo Kajombo, Anthony Charles

3:57–4:03 pm
199 Impact of Frailty on Complications in Patients with Thoracic and Thoracolumbar Spinal Trauma
Remi A. Kessler, Taylor E. Purvis, Rafael De la Garza Ramos, Ali K. Ahmed, C. Rory Goodwin, Daniel M. Sciubba

4:03–4:09 pm
200 A Retrospective Study of Thoracolumbar Burst Fractures Treated with Fixation and Non-fusion Surgery of Intra-vertebral Bone Graft Assisted with Balloon Kyphoplasty
Chengmin Zhang, Paul M. Arnold, Qiang Zhou

TU OCT 10 SECTION ON PAIN ORAL PRESENTATIONS

3:33–3:40
201 HCN Channels Blockade Attenuates Chemotherapy-induced Pain
Kun Hu, Zerong You, Weihua Ding, Jianren Mao

3:40–3:47 pm
202 Gamma Knife Pituitary Ablation for Chronic Cancer Pain Control
Richard L. Weiner

3:47–3:54 pm
203 Treatment Options Following Failed Gamma Knife Radiosurgery in Trigeminal Neuralgia: Long-term Outcome with Repeat Radiosurgery Versus Microvascular Decompression
Devi P. Patra, Amey Savardekar, Shyamal C. Bir, Anil Nanda

3:54–4:01 pm
204 Voluntary Exercise Modulates Macrophage Polarization Following Sciatic Nerve Injury and Improves Functional Recovery in Mice
Megan M. Jack, Douglas E. Wright

4:01–4:08 pm
205 Optimizing Outcomes with Permissive Brainstem Dosing and Anatomic Considerations in the Radiosurgical Treatment of Trigeminal Neuralgia
Michael Zhang, Matthew Schoen, Layton Lamsam, Geoff Appelboom, Scott G. Soltys, John R. Adler, Steven D. Chang

4:08–4:15 pm
206 Percutaneous Balloon Compression as Treatment to Trigeminal Neuralgia: 14 Years of Experience in a Single Center
Nilson Nogueira Mendes Neto, Jessika Thais da Silva Maia, Daniel Duarte Rolim, Marcelo Rodrigues Zacarkim, Juliano Jose da Silva, Sergio Adrian Fernandes Dantas

TU OCT 10 SECTION ON PEDIATRIC NEUROLOGICAL SURGERY ORAL PRESENTATIONS

2:45–2:51 pm
209 Surgical Outcomes with Insular and Insular-plus Pediatric Epilepsy: A Single-institution Experience
Andrew T. Hale, Luke Tomycz, Ali S. Haider, Dave Clarke, Mark R. Lee

2:51–2:57 pm
210 Post-traumatic Seizure in Pediatric Traumatic Brain Injury: Incidence, Risk Factors, and Outcomes in 124,444 Patients
Kavelin Rumalla, Megan Lilley, Mrudula Gandham, Rachana Kombathula, Usiakimi Igbaseimokumo

2:57–3:03 pm
211 Macromolecular Clearance from the Ventricles by Choroid Plexus in Experimental Hydrocephalus
Satish Krishnamurthy, Jie Li, Yimin Shen, Mark Haacke

3:03–3:09 pm
212 Hydrocephalus in Pediatric Traumatic Brain Injury: National Incidence, Risk Factors, and Outcomes in 124,444 Patients
Kavelin Rumalla, Vijay Letchuman, Bharadwaj Jilakara, Akhil Pulumati, Usiakimi Igbaseimokumo

3:09–3:15 pm
213 Efficacy of Endoscopic Third Ventriculostomy (ETV) After Shunt Malfunction in the Pediatric Age Group: A Meta-analysis to Evaluate the Impact of Hydrocephalus Aetiology
Mueez Waqar, Jonathan Ellenbogen, Conor Mallucci

TU OCT 10 SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY ORAL PRESENTATIONS

3:30–3:36 pm
214 Using Interictal Multivariate Granger Causality to Detect Epileptogenic Hubs
David P. Darrow, Theoden Netoff

3:36–3:42 pm
215 Laser Thermal Ablation for Mesiotemporal Epilepsy: Relation of Ablation Cavities to Seizure and Neurocognitive Outcomes
Walter J. Jermakowicz, Samir Sur, Iahn Cajigas, Pierre D'Haese, Jonathan R. Jagid

3:42–3:48
216 Chronic Subthreshold Cortical Stimulation for Adult Drug-resistant Focal Epilepsy: Safety, Feasibility, and Technique
Sanjeet S. Grewal, Panagiotis Kerezoudis, Matthew Stead, Brian N. Lundstrom, Jeffrey Britton, Chelsou Shin, Gregory Cascino, Benjamin H. Brinkmann, Gregory A. Worrell, Jamie J. Van Gompel

3:48–3:54 pm
217 Clinical Outcomes Following Awake and Asleep Deep Brain Stimulation for Parkinson's Disease
Tsinsue Chen, Zaman Mirzadeh, Kristina Chapple, Margaret Lambert, Holly Shill, Guillero Moguel-Cobos, Rohit Dhall, Alexander Troster, Francisco A. Ponce

3:54–4:00 pm
218 Target Selection for Deep Brain Stimulation in Children with Secondary Dystonia Utilizing Temporary Depth Electrodes for Stimulation and Chronic Recording
Richard A. Robison, Diana Ferman, Mark A. Liker, Terrence Sanger

4:00–4:06 pm
219 A Clinical Analysis on Microvascular Decompression Surgery for Treatment of Hemifacial Spasm: 2500 Case-review in a Single Institution
Myeongki Yeo, Bong J. Park, Hridayesh P. Malla, Bong Arm Rhee, Young-Jin Lim

4:06–4:12 pm
220 A Stereotactic Brain Biopsy Needle Integrating an Optical Coherence Tomography (OCT) Probe with Blood Vessel Detection in Human Patients
Hari H. Ramakonar

4:12–4:18 pm
221 Functional Modulation of the Blood Brain Barrier
Geoffrey Stricsek, Michael J. Lang, Ashwini D. Sharan, Robert H. Rosenwasser, Lorraine Iacovitti

TU OCT 10 SECTION ON TUMORS ORAL PRESENTATIONS

3:30–3:36 pm
222 Dexamethasone Induces Mesenchymal Trans-differentiation and Promotes Hallmarks of Cancer in Glioblastoma
Pascal O. Zinn, Markus M. Luedi, Sanjay K. Singh, Jennifer Mosley, Islam Hassan, Masumeh Hatami, Joy Gumin, Lukas Andereggen, Erik P. Sulman, Frederick F. Lang, Frank Stueber, Gregory N. Fuller, Rivka R. Colen

3:36–3:42 pm
223 Procedural Safety of Stereotactic Laser Ablation (SLA) and Associated Hospital Stay: Outcome from the First Hundred Patients from LAANTERN Prospective Registry
Clark C. Chen, Robert Rennert, Usman Khan, Stephen B. Tatter, Melvin Field, Brian Toyota, Peter E. Fecci, Kevin D. Judy, Alireza M. Mohammadi, Patrick Landazuri, Andrew E. Sloan, Eric C. Leuthardt

3:42–3:48 pm
224 Stereotactic Radiosurgery for Intracranial Ependymomas: An International Multicenter Study
Hideyuki Kano, Or Cohen-Inber, Jason P. Sheehan, David Mathieu, Yan-Hua Su, Hslu-Mei Wu, Rachel Jacobs, L. Dade Lunsford

3:48–3:54 pm
225 Markers and Mechanisms of Disease Progression in IDH-mutant Astrocytomas
Sameer H. Halani, Safoora Yousefi, Amelia Baxter-Stoltzfus, Mohamed Amgad, Jose Enrique Velazquez Vega, Jeffrey J. Olson, Lee Cooper, Daniel J. Brat

3:54–4:00 pm
226 PIK3CB/p110Đ is a Selective Survival Factor for Glioblastoma
Gary R. Simonds, Cara Rogers, Kevin Pridham, Zhi Sheng, Sujuan Guo

4:00–4:06 pm
227 Surgical Management of Ewing's Sarcoma of the Spine: Survival and Local Control Outcomes
Laurence D. Rhines, Michael S. Dirks, Stefano Boriani, Alessandro Luzzati, Michael G. Fehlings, Charles Fisher, Mark B. Dekutoski, Richard P. Williams, Nasir A. Quraishi, Ziya L. Gokaslan, Chetan Bettegowda, Niccole Germscheid, Peter Varga, Raphaële Charest-Morin

4:06–4:12 pm
COLUMBIA SOFTBALL PEDIATRIC BRAIN TUMOR AWARD
228 Interaction Between MELK and EZH2 Regulates Medulloblastoma Cancer Stem-like Cells Proliferation
Hailong Liu, Qianwen Sun, Chunjiang Yu, Chunyu Gu, Hongwei Zhang

RAPID-EXCHANGE ORAL PRESENTATIONS

TU OCT 10

7:00–8:30 am
RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 1
MODERATORS: W. Christopher Fox, John F. Reavey-Cantwell

7:00–7:03 am
301 Drivers and Components of Hospital Costs After Transsphenoidal Resection of Sellar Tumors
Jian Guan, Michael Karsy, Erica F. Bisson, William T. Couldwell

7:03–7:06 am
302 Validation of the Barrow Neurological Institute Scale for Symptomatic Vasospasm Prediction Following Aneurysmal Subarachnoid Hemorrhage
Christopher J. Stapleton, Brian P. Walcott, Seunggu J. Han, Matthew Koch, Arjun Khanna, Christopher S. Ogilvy, Aman B. Patel, Michael T. Lawton

7:06–7:09 am
303 Minimally Invasive Versus Open Transforaminal Lumbar Interbody Fusion: A Prospective Randomized Study
Anthony M. DiGiorgio, Gabriel C. Tender

7:09–7:12 am
304 Microvascular Decompression for Trigeminal Neuralgia: The Role of Mechanical Allodynia
Chenlong Liao, Wenchuan Zhang

7:12–7:15 am
305 Speckle-free and Large Gold Nanorod Enhanced Optical Coherence Tomography for Brain Tumor Margin Detection
Derek W. Yecies, Orly Liba, Elliot SoRelle, Rebecca Dutta, Christy Wilson, Gerald A. Grant, Adam de la Zerda

7:15–7:18 am
306 GCS Does Not Predict Cognitive Outcome 30 Years After Severe Traumatic Brain Injury
Molly E. Hubbard, Abdullah Bin Zahid, Gabrielle Meyer, Kathleen Vonderhaar, David Y. Balser, David Darrow, Anne Kleeberger, Drake Burri, Vikalpa Dammavalam, Shivani Venkatesh, David Tupper, Sarah B. Rockswold, Thomas A. Bergman, Gaylan L. Rockswold, Uzma Samadani

7:18–7:21 am
307 Stereotactic Radiosurgery for Pediatric High-grade Brain Arteriovenous Malformations
Mohana R. Patibandla, Dale Ding, Zhiyuan Xu, Jason P. Sheehan

7:21–7:24 am
308 EGFR Gene Amplification Predicts a Poor Response to Bevacizumab in Recurrent Glioblastoma
Koos E. Hovinga, Heather J. McCrea, Junting Zheng, Viviane Tabar

7:24–7:27 am
309 The Effect of 24-hour Call on Fine Motor Dexterity, Cognition, and Mood
Gary R. Simonds, Cara Rogers, Chris Busch

7:27–7:30 am
310 Differences in Stump Pressures Between Ruptured and Unruptured Intracranial Aneurysms
Yiping Li, Mark Corriveau, Azam S. Ahmed, Beverly Aagaard-Kienitz, David B. Niemann

7:30–7:33 am
311 Prolonged Preoperative Opioid Therapy in Patients with Degenerative Lumbar Stenosis In a Worker's Compensation Setting
Erik Y. Tye, Joshua T. Anderson, Jay M. Levin, Arnold Haas, Stephen T. Woods, Nicholas U. Ahn

7:33–7:36 am
312 An Evaluation of the Clinical and Histological Effects of High-dose Radiosurgery on the Rat Dorsal Root Ganglion
Ezequiel Goldschmidt, Wendy Fellows-Mayle, Erin Paschel, Ajay Niranjan, John Flickinger, L. Dade Lunsford, Peter C. Gerszten

7:36–7:39 am
313 Morphometric and Volumetric Comparison of Symptomatic and Asymptomatic Chiari Malformation Type I
Siri Sahib S. Khalsa, Ndi Geh, Bryn A. Martin, Philip A. Allen, Jennifer Strahle, Francis Loth, Desale Habtzghi, Aintzane Urbizu, Hugh Garton, Karin M. Muraszko, Cormac O. Maher

7:39–7:42 am
314 Reversal of Betrixaban-induced Anticoagulation in Healthy Volunteers by Andexanet Alfa
Mark Crowther, Genmin Lu, Janet Leeds, Joyce Lin, Alex Gold, Stuart Connolly, John Curnutte, Pamela B. Conley

7:42–7:45 am
315 The Neural Architecture of Human Syntax in Wernicke's Area Revealed by Cortical Recordings and Stimulation
Ziv Williams, Daniel Lee, Brian V. Nahed, Daniel P. Cahill

7:45–7:48 am
316 Extent of Resection and MGMT Promotor Methylation Status are Independent Risk Factors in IDH1_R132H Wild-type Primary Glioblastomas
Florian Gessler, Anne Braczynski, Stephanie Tritt, Peter Baumgarten, Patrick Harter, Joshua Bernstock, Tianxia Wu, Michel Mittelbronn, Volker Seifert, Christian Senft

7:48–7:51 am
317 Cost-effectiveness of a Novel Cervical Spine Clearance Protocol: Obviating the Need for Routine Magnetic Resonance Imaging
Jared Ament, Bart Thaci, Mena Said, Ripul R. Panchal, Kee Duk Kim, J. Patrick Johnson

7:51–7:54 am
318 Study of the Clinical, ECG, and Biochemical Spectrum of Cardiovascular Complications in Patients of Aneurysmal Subarachnoid Hemorrhage: An Initial Experience at a Tertiary Centre in India
Charandeep S. Gandhoke, Simran Syal, Daljit Singh, Bhawna Mahajan, Monica Tandon

RAPID-EXCHANGE ORAL PRESENTATIONS

7:54–7:57 am
319 Determining the Role of Informed Consent Allegations in Spinal Surgery Medical Malpractice
Jennifer Grauberger, Panagiotis Kerezoudis, Asad Choudhry, Mohammed A. Alvi, Sandy Goncalves, Jenna Meyer, Ahmad Nassr, Bradford L. Currier, Mohamad Bydon

7:57–8:00 am
320 The Identification of a Sub-group of Children with Traumatic Subarachnoid Hemorrhage at Low-risk of Neuroworsening
Cecilia L. Dalle Ore, Robert Rennert, Alexander J. Schupper, Brandon C. Gabel, David D. Gonda, Bradley Peterson, Lawrence F. Marshall, Michael L. Levy, Hal S. Meltzer

8:00–8:03 am
321 Subsequent Pulse Generator Replacement Surgery Does Not Increase the Infection Rate in Patients with Deep Brain Stimulator Systems: A Review of 1537 Unique Implants at a Single Center
Leonardo A. Frizon, Olivia Hogue, Connor Wathen, Erin A. Yamamoto, Navin C. Sabharwal, Jaes Jones, Josephine Volovetz, Andres Maldonado-Naranjo, Darlene A. Lobel, Andre Machado, Sean J. Nagel

8:03–8:06 am
322 Rate of Residual Tumor Growth After Primary Subtotal Resection (STR) and the Role of Upfront Versus Salvage Stereotactic Radiosurgery (SRS) for Sporadic Vestibular Schwannomas
Jonathan D. Breshears, Carlene Partow, Tarik Tihan, Michael W. McDermott, Patricia Sneed, Steven W. Cheung, Philip V. Theodosopoulos

8:06–8:09 am
323 Comparison Between Balloon-assisted and Stent-assisted Technique for Treatment of Unruptured Internal Carotid Artery Aneurysms
Jihwan Yoo, Keun Young Park, Dong Jun Kim

8:09–8:12 am
324 Lumbar Interbody Fusion Status Does Not Correlate with Patient-reported Outcomes: Data Analysis from a Prospective Multi-center Study of Circumferential Lumbar Arthrodesis
Bart Thaci, Chris Ferry, Brieta Ventimiglia, Tom Glorioso, Kim Martin, Sarah Martineck, Ripul R. Panchal, Paul M. Arnold, Peter G. Passias, Alex De Moura, Brandon Strenge, Clint Hill, Ryan P. Denhaese, Kee Duk Kim

8:12–8:15 am
325 Thrombocytosis as a Predictor of Outcome In Severe TBI
William J. Ares, Joshua S. Bauer, David O. Okonkwo

8:15–8:18 am
326 Characterization of Synchronization Between Globus Pallidus Neurons and Motor Cortex in Parkinson's Disease
Doris D. Wang, Nicki Swann, Coralie de Hemptinne, Philip A. Starr

8:18–8:21 am
327 B7-H3 Chimeric Antigen Receptor Modified T Cells Show Potent Anti-tumor Activity in a Preclinical Model of Glioblastoma
Kwong-Hon (Kevin) Chow, Sabine Heitzeneder, Peng Xu, Johanna Theruvath, Siddhartha S. Mitra, Samuel H. Cheshier, Gordon Li, Crystal Mackall

8:21–8:24 am
328 Outcome Analysis of Common Peroneal Nerve Neuroplasty at Lateral Fibular Neck
John Souter, Kevin Swong, Matthew McCoyd, Magan Nielsen, Neelam Balasubramanian, Vikram C. Prabhu

8:24–8:27 am
329 Primary and Secondary Glioblastomas are Driven by Distinct Forms of Fusion Oncoproteins
Mir A. Ali, Jason N. Compton, Kate T. Carroll, Robert Rennert, Tao Jiang, Clark C. Chen

8:27–8:30 am
330 Surgical Site Infections in Standalone Lateral Interbody Fusion: Analysis of a Prospective, Multi-center Patient Outcomes Registry
Gautam Madhu Nayar, Timothy Y. Wang, Adam Gregory Back, Kyle Malone, Robert E. Isaacs

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7:00–8:30 am
RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 2
MODERATORS: William R. Stetler, Martina Stippler

7:00–7:03 am
331 Pilot Study for Evaluating Clinical Outcome and Socioeconomic Value of a Novel Integrative Healing Services Approach to Neurosurgery Inpatients
John Roufail, Ronald Sahyouni, Frank P.K. Hsu, Sumeet Vadera

7:03–7:06 am
332 Factors that Predict Surgical Candidacy in Degenerative Spine Disorders: A Clinical Prediction Model
Michael M.H. Yang, Godefroy H. St. Pierre, Stephan DuPlessis

7:06–7:09 am
333 Intervertebral Disc Repair Following Microdiscectomy Mediated by Pentosan Polysulfate Primed Mesenchymal Progenitor Cells in an Ovine Model
Chris D. Daly, Peter Ghosh, Tanya Badal, Ronald Shimmon, Ian Ghosh, Graham Jenkin, David A. Oehme, Idrees Sher, Ronil V. Chandra, Angela Vais, Camilla Cohen, Tony Goldschlager

7:09–7:12 am
334 Anterior Screw Plate Fixation for Odontoid Fractures: A New Technique
Sushil Patkar

7:12–7:15 am
335 Radiation-induced Cerebral Cavernomas in Pediatric Neuro-Oncology: A 25-year Single Institution Review
Tyler Schmidt, Michelle Lawson, Emily Silberstein, Jonathan J. Stone, Howard J. Silberstein

7:15–7:18 am
336 Civilian Penetrating Craniocerebral Gunshot Injuries: Post-operative Management and Complications
Alexander Tai, Daniel Felbaum, Ai-Hsi Liu, Robert B. Mason, II, Rocco Armonda, Jack Sava, Edward F. Aulisi

7:18–7:21 am
337 Pallidocortical Beta Coherence Decreases with Pallial Deep Brain Stimulation in Parkinson Disease
Yalda Shahriari, Mahsa Malekmohammadi, Andrew B. O'Keeffe, Xiao Hu, Nader Pouratian

7:21–7:24 am
338 Variation in the Cost/Benefit of Spine Surgery at the Individual Patient Level: Re-examining the Definition of Health Care Value
Scott L. Parker, Silky Chotai, Clinton J. Devin, Lindsay Tetreault, Matthew J. McGirt

7:24–7:27 am
339 Outcome of Tibial Selective Motor Fasiculotomy in the Management of Equinovarus Deformity Due to Cerebral Palsy (A Prospective Cohort Study in 14 Children)
Pavankumar Pelluru, Aneelkumar Pulugopu, Aniruddhkumar Purohit, Naveenkumar Balane

7:27–7:30 am
340 Trends and Disparities in Cervical Spine Fusion Procedure Utilization in New York State
Rui Feng, Mark Finkelstein, Eric K. Oermann, Michael Palese, John M. Caridi

7:30–7:33 am
341 Prognostic Factors Associated with Improved Quality of Life Following Spine Tumor Separation Surgery: A Secondary Analysis of a Prospective Study
Ori Barzilai, Lily McLaughlin, Mary Kate Amato, Anne Reiner, Shahiba Oglivie, Eric Lis, Yoshiya J. Yamada, Mark H. Bilsky, Ilya Laufer

7:33–7:36 am
342 Obstetric Management and Maternal Outcomes of Childbirth Among Patients with Chiari Malformation Type I
D. Andrew Wilkinson, Kyle Johnson, Peris Castaneda, Hugh Garton, Karin M. Muraszko, Cormac O. Maher

7:36–7:39 am
343 A New Computed Tomography-based Frontal Contusion Score for Patients with Traumatic Brain Injury
Qiang Yuan

7:39–7:42 am
344 Studying the Single-cellular Substrates of Autism in a Mouse Model
Gabriel N. Friedman, Mohsen Jamali, Firas Bounni, Ziv Williams

7:42–7:45 am
345 Analysis of 3,298 Consecutive Neurosurgical Cases Demonstrates Overlapping Surgery Has No Adverse Effect on Patient Outcome
Brian M. Howard, Christopher M. Holland, David P. Bray, Jason J. Lamanna, James G. Malcolm, Daniel L. Barrow, Jonathan A. Grossberg

7:45–7:48 am
346 The Utility of Posterior Vertebral Column Subtraction Osteotomies for Tethered Cord Syndrome
Shashank V. Gandhi, Ahmad Latefi

7:48–7:51 am
347 Histopathology of Necrotic Spinal Cord Tissue Exudate Collected During Surgical Implantation of a Biodegradable Scaffold Following Acute Spinal Cord Injury: Pre-clinical and Clinical Findings
K. Stuart Lee, Philip J. Boyer, Patrick C. Hsieh, Kyle M. Hurth, James D. Guest, Alex Aimetti, Richard T. Layer, Simon W. Moore, Thomas Ulich

7:51–7:54 am
348 Circumferential Correction of Post-infectious Thoracolumbar Deformity in High-risk Patients with Active Osteomyelitis
Mazda K. Turel, Mena Kerolus, Ricardo B.V. Fontes

7:54–7:57 am
349 Online Resources Provide Inconsistent Return To Play Instructions Following Concussion
Jennylee S. Swallow, Jacob R. Joseph, Kylene Willsey, Paul Park, Nicholas J. Szerlip, Steven P Broglio

7:57–8:00 am
350 Stereoelectroencephalography for Refractory Localization-related Epilepsy: Initial Experience in 50 Patients
Brett E. Youngerman, Justin Oh, Yagna Pathak, Garrett P. Banks, Sameer A. Sheth, Neil Feldstein, Guy M. McKhann, II

8:00–8:03 am
351 Diffusion and Cerebrospinal Fluid Flow Magnetic Resonance Imaging in the Evaluation of Cervical Stenosis and Myelopathy: A Prospective Study
Darryl Lau, Cynthia Chin, Philip R. Weinstein, John Engstrom, Christopher P. Ames

8:03–8:06 am
352 The Effect of Epidural Steroid Injections on Bone Mineral Density and Vertebral Fracture Risk: A Systematic Review and Critical Appraisal of Current Literature
Panagiotis Kerezoudis, Lorenzo Rinaldo, Mohammed A. Alvi, Sandy Goncalves, Christine Hunt, Wenchun Qu, Timothy P. Maus, Mohamad Bydon

8:06–8:09 am
353 C2 Segmental Neurofibromas in Patients with Neurofibromatosis Type 1: A Particularly Aggressive Phenotype
Mueez Waqar, Calvin Soh, John Ealing, Susan Huson, Gareth Evans, Konstantina Karabatsou, Joshi George

8:09–8:12 am
354 Pre-operative Risk Score Predicts 30-day Mortality Following Subdural Hematoma Evacuation
Samuel Tomlinson, Joseph Van Galen, Alexis E. Zavez, Keaton Piper, Kristopher T. Kimmell, G. Edward Vates

8:12–8:15 am
355 Learning-related Power Changes in Caudate Nucleus
Sarah K. Bick, Shaun Patel, Emad N. Eskandar

RAPID-EXCHANGE ORAL PRESENTATIONS

8:15–8:18 am
356 Quantitative Magnetization Transfer MRI Measurements of the Anterior Spinal Cord Region are Associated with Clinical Outcomes in Cervical Spondylotic Myelopathy
Michael B. Cloney, Andy C. Smith, Kenneth Weber, Meijing Wu, Taylor Coffey, Alex Barry, Benjamin P. Liu, Yasin Dhaher, Todd Parish, Maciej S. Lesniak, Zachary A. Smith

8:18–8:21 am
357 Comparative Effectiveness between Primary and Revision Foraminotomy for the Treatment of Lumbar Foraminal Stenosis
Emily Hu, Jianning Shao, Heath P. Gould, Roy Xiao, Colin Haines, Don K. Moore, Thomas E. Mroz, Michael P. Steinmetz

8:21–8:24 am
358 Lumbar Spondylolisthesis Geographic Variation in Arthrodesis Rates, Costs, and Narcotic Outcomes
Tej Deepak Azad, Daniel Vail, Chloe O'Connell, Anand Veeravagu, John K. Ratliff

8:24–8:27 am
359 Combinatorial Surgical and Neuroprotective Therapy for Cervical Spondylotic Myelopathy Results in Improved Neurological Function: From Preclinical Proof of Concept to a Phase III Randomized Controlled Trial
Michael G. Fehlings, Spyridon K. Karadimas, Branko Kopjar, Paul M. Arnold

8:27–8:30 am
360 Evaluating Quality of Life and Cost-effectiveness in Adult Spine Surgery: Prospective Validation of Measurement Tools in a Local Adult Spine Patient Population
Julio D. Montejo, Jr., Shreyas Panchagnula, Aria Nouri, Luis Kolb, Justin Virojanapa, Joaquin Q. Camara-Quintana, Khalid M. Abbed, Joseph S. Cheng

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7:00–8:30 am
RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 3
MODERATORS: Kyle M. Fargen, Raul Vasquez-Castellanos

7:00–7:03 am
361 Bypass Surgery Versus Medical Treatment for Symptomatic Moyamoya Disease in Adults
Kwan-Sung Lee, Dong-Kyu Jang, Hyoung Kyun Rha, Pil-Woo Huh, Ji-Ho Yang, Ik Seong Park, Jae-Geun Ahn, Jae Hoon Sung, Young-Min Han

7:03–7:06 am
362 Outcomes of Stereotactic Radiosurgery for Foramen Magnum Meningiomas: An International Multicenter Study
Gautam U. Mehta, Georgios A. Zenonos, Mohana R. Patibandla, Chung J. Lin, Amparo M. Wolf, Inga S. Grills, David Mathieu, Brendan McShane, John Y.K. Lee, Kevin Blas, Douglas Kondziolka, Cheng-Chia Lee, L. Dade Lunsford, Jason P. Sheehan

7:06–7:09 am
363 Incidence of Stroke Associated with Non-cerebrovascular Surgery for Patients with Moyamoya or Carotid Occlusion
Alex M. Witek, Nina Z. Moore, Mark D. Bain

7:09–7:12 am
364 Tumor Compression Effect on White Matter Pathways Revealed by Local Connectome Fingerprint
Pinar Celtikci, David T. Fernandes Cabral, Yeh Fang-Cheng, Sandip S. Panesar, Juan C. Fernandez-Miranda

7:12–7:15 am
365 Beyond Large Vessel Occlusion Strokes: Distal Occlusion Thrombectomy
Jonathan A. Grossberg, Leticia C. Rebello, Diogo C. Haussen, Mehdi Bouslama, Michael R. Frankel, Raul G. Nogueira

7:15–7:18 am
366 Cumulative Intracranial Tumor Volume and Number of Brain Metastasis as Predictors of Developing New Lesions After Stereotactic Radiosurgery for Brain Metastasis.
Mayur Sharma, Xuefei Jia, Gene H. Barnett, Michael A. Vogelbaum, Samuel T. Chao, John H. Suh, Erin Murphy, Jennifer Yu, Lilyana Angelov, Alireza M. Mohammadi

7:18–7:21 am
367 Functional Outcome in Patients with Refractory Cerebral Vasospasm Treated with Repeat Instant Endovascular Interventions
Lukas Andereggen, Juergen Beck, Werner Z'Graggen, Gerhard Schroth, Robert H. Andres, Michael Murek, Matthias Haenggi, Michael Reinert, Andreas Raabe, Jan Gralla

7:21–7:24 am
368 Extent of Vascular Dysregulation in Diffuse Gliomas is Determined by IDH1 Mutation Status
Zachary K. Englander, Craig I. Horenstein, Stephen G. Bowden, Marc L. Otten, Angela Lignelli, Jeffrey N. Bruce, Peter D. Canoll, Jack Grinband

7:24–7:27 am
369 The TREVO Registry-Subgroup Analysis, Treatment Beyond Six Hours
Mandy Jo Binning, Erol Veznedaroglu, Ronald Budzik, Joey English, Blaise Baxter, Bruno Bartolini, David S. Liebeskind, Antonin Krajina, Rishi Gupta, Raul G. Nogueira

7:27–7:30 am
370 Hypoxic Conditions and Hypoxia-inducible Factor 1-Alpha are Critical in the Radioresistance of Meningioma
Michael Karsy, David Gillespie, Randy L. Jensen

7:30–7:33 am
371 Risk of De Novo Aneurysm Formation in Patients Before Obliteration of Brain Arteriovenous Malformations (AVMs)
Alice L. Hung, Taylor E. Purvis, Wuyang Yang, Tomas Garzon-Muvdi, Justin M. Caplan, Geoffrey P. Colby, Alexander L. Coon, Rafael J. Tamargo, Judy Huang

7:33–7:36 am
372 Evolving Patterns in Clinical Utilization of Stereotactic Laser Ablation (SLA): An Analysis of the Multi-center Prospective Registry LAANTERN
Clark C. Chen, Robert Rennert, Usman Khan, Stephen B. Tatter, Melvin Field, Brian Toyota, Peter E. Fecci, Kevin D. Judy, Alireza M. Mohammadi, Patrick Landazuri, Andrew E. Sloan, Eric C. Leuthardt

7:36–7:39 am
373 Risk of Hemorrhage Following Radiosurgery for Cerebral Arteriovenous Malformations (AVMs) is Associated with Venous Stenosis
Andrew Luksik, Jody Law, Wuyang Yang, Tomas Garzon-Muvdi, Justin M. Caplan, Geoffrey P. Colby, Alexander L. Coon, Rafael J. Tamargo, Judy Huang

7:39–7:42 am
374 Peripheral Regulatory T Cells are Expanded but Do Not Impact Survival in Newly Diagnosed Glioblastoma
Joseph D. DiDomenico, Daniel E. Oyon, Winward Choy, Jonathan B. Lamano, Dorina Veliceasa, Leonel Ampie, Jason Lamano, Orin Bloch

7:42–7:45 am
375 Ketamine Inhibits Cortical Spreading Depolarization in Acute Brain Injury: A Prospective Randomized Multiple Crossover Trial
Andrew P. Carlson, Mohammad Abbas, Rob Alunday, Fares Qeadan, C. William Shuttleworth

7:45–7:48 am
376 Human Connectome-based Tractographic Atlas of the Brainstem Connections and Surgical Approaches
Antonio Meola, Fang-Cheng Yeh, Wendy Fellows-Mayle, Jared Weed, Juan C. Fernandez-Miranda

7:48–7:51 am
377 Somatosensory-evoked Potentials During Temporary Arterial Occlusion for Intracranial Aneurysm Surgery: Predictive Value for Perioperative Stroke
Ahmed Kashkoush, Brian T. Jankowitz, Paul A. Gardner, Robert M. Friedlander, Yue-Fang Chang, Donald Crammond, Jeffrey Balzer, Parthasarathy D. Thirumala

7:51–7:54 am
378 Analysis of Molecular Markers and Volumetric Extent of Resection on Survival for Insular Gliomas
Chikezie Eseonu, Karim ReFaey, Gugan Raghuraman, Alfredo Quinones-Hinojosa

7:54–7:57 am
379 Matrix Metalloproteinase-9: A Key Contributor to Delayed Cerebral Ischemia After Subarachnoid Hemorrhage
Ananth K. Vellimana, Meng-Liang Zhou, Itender Singh, Diane J. Aum, James Nelson, Byung Hee Han, Gregory J. Zipfel

7:57–8:00 am
380 Seizure Outcome After Surgical Sesection of Insular Glioma
Doris D. Wang, Shawn L. Hervey-Jumper, Edward F. Chang, Mitchel S. Berger

8:00–8:03 am
381 Reductions in Brain Pericytes are Associated with Arteriovenous Malformation Vascular Instability
Ethan A. Winkler, Harjus Birk, Jan-karl Burkhardt, Xiaolin Chen, John K. Yue, Diana Guo, William C. Rutledge, George Lasker, Tarik Tihan, Edward F. Chang, Hua Su, Helen Kim, Brian P. Walcott, Michael T. Lawton

8:03–8:06 am
382 Resection of Gliomas Initially Deemed to be Inoperable
Derek Southwell, Harjus Birk, Seunggu J. Han, Mitchel S. Berger

8:06–8:09 am
383 Fever and Leukocytosis as a Predictor of DCI After SAH
Diane Aum, Ananth K. Vellimana, Alexander Padovano, Eric J. Arias, Umeshkumar Athiraman, Gregory J. Zipfel

8:09–8:12 am
384 Post-operative ICU Admission for Elective Craniotomy for Intra-axial Brain Tumor Resection
Farhan A. Mirza, Catherine Y. Wang, Thomas Pittman

8:12–8:15 am
385 Focal-enhanced Delivery of Systemically Administered Therapeutic Human Mesenchymal Stem Cells Using MRI-guided Disruption of the BBB with Focused Ultrasound
Rawan al-Kharboosh, Nicholas Ellens, Katarina Cheng, Maarten Rotman, Jordan Green, Alfredo Quinones-Hinojosa

8:15–8:18 am
386 An Externally Validated Machine Learning Ensemble Model Accurately Predicts Important Neurosurgical Outcomes
Whitney Muhlestein, Lola B. Chambless

8:18–8:21 am
387 Ischemic Preconditioning Reduces the Incidence of Postoperative Ischemic Lesions in Patients Undergoing Surgical Resection of Brain Tumors: A Single Center, Randomized, Double-blind, Controlled Trial
Arthur H. A. Sales, Melanie Barz, Stefanie Bette, Benedikt Wiestler, Yu-Mi Ryang, Bernhard Meyer, Martin Bretschneider, Florian Ringel, Jens Gempt

8:21–8:24 am
388 Prognostic Value of N-terminal Pro-B-type Natriuretic Peptide Concertation in Brain Tumor Patients: A 5-year Follow-up Study
Adomas Bunevicius, Vytenis Deltuva, Edward R. Laws, Giorgio Iervasi, Arimantas Tamasauskas

8:24–8:27 am
389 Advanced Intraoperative Navigated Ultrasound in Brain Tumor Surgery: Lessons Learned from a Personal Experience of 300 Cases
Aliasgar V. Moiyadi

8:27–8:30 am
390 The Impact of Extent of Resection on IDH1 Wild-type or Mutant Low-grade Gliomas
Toral R. Patel, Evan D. Bander, Rachael A. Venn, Tiffany L. Powell Avila, Gustav Y. Cederquist, Peter M. Schaefer, Luis A. Puchi, Akbarshakh Akhmerov, Shahiba Ogilvie, Anne Reiner, Nelson Moussazadeh, Viviane S. Tabar

CONTINUING MEDICAL EDUCATION

CONGRESS OF NEUROLOGICAL SURGEONS 2017 ANNUAL MEETING OBJECTIVES

The Congress of Neurological Surgeons (CNS) 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 2017 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, Dinner Seminars, and Symposia, which are available for an additional fee.

PRACTICAL COURSES AND SYMPOSIA

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

- Practical Courses and Symposia are offered Saturday, October 7, and Sunday, October 8.

GENERAL SCIENTIFIC SESSION, SECTION SESSIONS, GUIDELINES 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. These sessions provide basic skills and information you can apply in your daily practice and professional life.

- General Scientific Sessions, Section Sessions, and Guidelines Sessions are offered Sunday, October 8, through Wednesday, October 11.
- Luncheon Seminars are offered Monday, October 9, through Wednesday, October 11.
- Dinner Seminars are offered on Saturday, October 7; Monday, October 9; and Tuesday, October 10.
- Live Surgery via Telemedicine in the Exhibit Hall will take place Monday, October 9, through Wednesday, October 11. CME is not offered for these sessions.

CASE-BASED EDUCATION

During the Case-based Discussion Sessions, faculty will present cases to be examined, discussed, and debated by both the audience and panel. Registered attendees will have the opportunity to submit their own cases prior to the meeting to be presented at these sessions. Don't miss these interactive sessions designed to encourage participation from everyone!

- Case-based Discussion Sessions will take place on Monday, October 9 and Tuesday, October 10.
- Submit your case at cns.org/casebased

SCIENTIFIC PROGRAM

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

- Oral Presentations by subspecialty and CNS Poster Viewing take place on Monday, October 9, and Tuesday, October 10.
- Rapid-exchange Oral Presentations by subspecialty take place on Tuesday, October 10, and Wednesday, October 11.
- Late-breaking Abstracts are presented on Tuesday, October 10.

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 designates this live activity for a maximum of 47.75 *AMA PRA Category 1 Credits*™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

*A maximum of 22.25 *AMA PRA Category 1 Credits*™ may be earned for general sessions only.

Advanced Practice Provider: The CNS cannot designate its Annual Meeting as meeting the criteria for credit for nurses and other allied health professionals. For credit that may be acceptable to state medical associations, specialty societies, or state boards for medical licensure, please contact those organizations directly.

ADDITIONAL CME CREDITS CAN BE EARNED BY ATTENDING THE FOLLOWING:

Practical Courses

Attendees will receive a maximum of three-and-a-quarter (3.25) *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-quarter (3.25) *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 only claim credit commensurate with the extent of their participation in the activity.

Symposia

Attendees will receive a maximum of eight (8) *AMA PRA Category 1 Credits*™ for the eligible Saturday Symposium, a maximum of seven (7) *AMA PRA Category 1 Credits*™ for each eligible Sunday Symposia, and a maximum of one-and-one-half (1.5) *AMA PRA Category 1 Credits*™ for the eligible Wednesday Symposium.

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 only claim 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 only claim 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*™ directly from the AMA for preparing a poster presentation, which is also included in the published abstracts. Physicians may claim them on their AMA PRA certificate application or apply directly to the AMA for an *AMA PRA Category 1 Credits*™ certificate.

Physicians may claim *AMA PRA Category 2 Credits*™ for viewing scientific posters. Physicians should self-claim credit on their AMA PRA certificate application form. Please visit the AMA web site for details at www.ama-assn.org.

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.

Disclosures will be published in the Scientific Program Book that will be distributed at the Annual Meeting. Handout materials are prepared and submitted for distribution by the presenters who are solely responsible for their content.

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 devices 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.

GENERAL INFORMATION

AIRPORT

The CNS Annual Meeting hotels and the Boston Convention & Exhibition Center are located approximately four miles from the Boston–Logan International Airport (BOS).

Taxis are readily available from each terminal curbside at the Logan International Airport.

AMERICANS WITH DISABILITIES ACT

Wheelchairs, scooters, information booths, designated parking, TDD telephones, and other services are available for visitors with disabilities. For wheelchair or electric scooter rental, please contact Penfield's Office at 617-532-4635. Penfield's Office strongly suggests that you make your reservation in advance of your arrival.

Please let us know if, under the ADA, you require special accommodations or services in order to attend the 2017 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 Annual Meeting Registration and Housing Center at: cns@wynhdamjade.com or by calling 1-800-931-9543. Please provide any requests at least 30 days prior to the Annual Meeting to allow adequate time to accommodate your request.

ATTIRE

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

SPOUSE HOSPITALITY SUITE AND AUXILIARY ACTIVITY

All registered CNS Annual Meeting spouses and guests are invited to visit the CNS Spouse Hospitality Suite at the Westin Boston Waterfront, Monday through Wednesday, from 8:00–10:30 am for continental breakfast. Please note that admittance to the Spouse Hospitality Suite is by spouse/guest badge only.

A representative from Signature Boston (Boston Convention & Visitors Bureau) will be available at the CNS Spouse Hospitality Suite on Monday, October 9, to offer lunch/dinner recommendations and activity/tour options to spouses and guests.

CHILDREN

Children over the age of 12 should register at the non-medical 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 48°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 are displayed electronically, Monday through Wednesday, in the Exhibit Hall, and can be searched by author, topic, or keyword.

DISCLAIMER

The material presented at the 2017 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.

EXHIBIT HALL

Monday, October 9	9:30 am–3:00 pm
Tuesday, October 10	9:30 am–3:00 pm
Wednesday, October 11	9:30 am–3:00 pm

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

FUTURE MEETINGS

2018: Houston, Texas, October 6–10
2019: San Francisco, California, October 19–23

HOUSING INFORMATION

See pages 79-83 for detailed information.

CNS XPERIENCE LOUNGE, POWERED BY SURGICAL THEATER

Immerse yourself in the best of the CNS Annual Meeting in the new CNS Xperience Lounge, powered by Surgical Theater. Get up close and personal with this year's awardees, connect with your colleagues and mentors and get your hands on new technology featured throughout the meeting.

REGISTRATION INFORMATION

Items included in registration fee:

- Admission to General Scientific Sessions, Sunday–Wednesday
- Scientific Program to include Section Sessions and Oral Presentations, Case-based Discussion Sessions, Rapid-exchange Oral Presentations, Big Data Symposium, Guidelines Sessions, Posters, and Digital Posters
- Live Surgeries in the Exhibit Hall
- Exhibit Hall Access, Monday–Wednesday
- Access to the CNS Xperience Lounge, powered by Surgical Theater
- Industry Sponsored Lunch Symposia
- One ticket to the Opening Reception on Sunday, October 8

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.

PRESS ROOM

All media representatives and journalists attending the Annual Meeting are required to register in advance. Registration, Press Room guidelines, and media credentialing policies are available online at cns.org/2017 or by calling 847-805-4493. Once onsite, media are required to check-in at the CNS registration area to pick up their press badges, and then proceed to the Press Room to pick up their press kits.

REGISTRATION INFORMATION AND HOURS:

Saturday, October 7	7:00 am–5:30 pm
Sunday, October 8	7:00 am–7:00 pm
Monday, October 9	6:30 am–6:30 pm
Tuesday, October 10	6:30 am–6:30 pm
Wednesday, October 11	6:30 am–4:15 pm

SHUTTLE SERVICES

Shuttle service to the Boston Convention & Exhibition Center will be available beginning Saturday, October 7, from select CNS Hotels as indicated in Housing Information on pages 79-83. A shuttle schedule will be posted at the hotels and convention center.

SMOKING

The Boston Convention & Exhibition Center and official CNS hotels are non-smoking facilities.

SPEAKER READY ROOM

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

Saturday, October 7	7:00 am–4:30 pm
Sunday, October 8	7:00 am–6:30 pm
Monday, October 9	6:30 am–5:00 pm
Tuesday, October 10	6:30 am–5:00 pm
Wednesday, October 11	6:30 am–3:30 pm

VISA INFORMATION

The State Department of the United States encourages international participants to apply for their visas as early as possible—at least three 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.state.gov/content/visas/en/general/wait-times.html/.

For information on the visa process, please visit http://www.nationalacademies.org/visas.

The U.S. State Department's visa site contains the official information on the visa application process: http://travel.state.gov/content/visas/en.html.

WI-FI SERVICE

For your convenience, complimentary Wi-Fi service is provided throughout the Boston Convention & Exhibition Center and the Westin Boston Waterfront wherever CNS events are being held.

REGISTRATION INFORMATION

REGISTRATION METHODS

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

ONLINE
cns.org/2017

PHONE*
800-931-9543 US & Canada
972-349-5539 International
8:00 am–6:30 pm CST

FAX*
972-349-7715

MAIL*
CNS Annual Meeting
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
- Discover

CHECK PAYMENTS

- US dollars and drawn on a US bank
- Full payment must accompany your registration form
- Any checks received from an overseas bank will be returned
- Any checks returned for insufficient funds are subject to additional charges

MATERIALS PICK-UP

All materials should be picked up on-site at the Boston Convention & Exhibition Center.

REGISTRATION RATES	ADVANCE REGISTRATION	AFTER SEPTEPMBER 7, 2017
MEMBER REGISTRANT		
Active (Domestic & International)	$ 750	$ 950
International Vista	$ 750	$ 950
Associate*	$ 750	$ 950
Active Duty Military	$ 0	$ 0
Armed Forces (Guard/Reserve/Retiree)	$ 475	$ 675
Transitional	$ 750	$ 950
Resident (Domestic & International)	$ 150	$ 250
Fellow (Domestic & International)	$ 200	$ 300
Senior	$ 450	$ 650
Medical Student	$ 0	$ 200
Affiliate†	$ 350	$ 550
NON-MEMBER REGISTRANT		
Neurosurgeon	$ 1000	$ 1200
Physician (MD, DO, etc.)	$ 1000	$ 1200
Non-physician (Clinical Researcher/Scientist) ††	$ 1000	$ 1200
Neurosurgeon (Faculty)	$ 850	$ 1050
Resident**	$ 400	$ 500
Fellow***	$ 450	$ 550
Medical Student	$ 250	$ 450
PA/Physician Extender/Nurse/Nurse Practitioner	$ 600	$ 800
Corporate Representative†††	$ 1250	$ 1450

Non-member registration categories are open to domestic and international registrants.

*Associate category includes physicians and/or scientists who are not neurological surgeons but have shown distinction in a neurosurgically-related discipline.
**All non-member residents must have their Program Director sign their registration form. If registering online, a letter from your Program Director certifying that you are a resident in a neurosurgical training program must be faxed to 972-349-7715, or e-mailed to cns@wyndhamjade.com, within one week of completing registration.
*** All non-member fellows must attach a letter from their Chief of Service verifying fellow status within one week of completing registration.
† Affiliate category includes allied health professionals involved in neurosurgical related patient care, teaching or research, such as physician assistant, physician extender, nurse, nurse practitioner, and non-nurse.
†† Non-member/non-physician category is limited to scientists, engineers, etc., involved in neurosurgical research and/or product development not affiliated with an exhibiting company.
†††Corporate representatives attend for education only. They must not conduct sales activities in the meeting space, nor influence content in any way. Solicitation of medical attendees is strictly prohibited.

IMPORTANT DATES TO REMEMBER

SEPTEMBER 7 Advance registration discount and housing deadline

SEPTEMBER 14 Last day to cancel registration in order to receive a full refund, less a $100 processing fee

SEPTEMBER 26 Last day to make any hotel changes or cancellations through the CNS Housing provider:
Email: cns@wyndhamjade.com
Phone: 800-931-9543
International: 972-349-5539

SEPTEMBER 28 Any hotel changes or cancellations must be made directly with the hotel after September 28. Individual hotel cancellation policies can be found on your original housing confirmation.

REGISTRATION CHANGE/CANCELLATION INFORMATION

Full registration refunds, less a $100 processing fee, will be granted if written requests for cancellation are received by 5:00 pm CST on September 14, 2017. Course, seminar, and event tickets will be refunded in full until September 14, 2017. No refunds of any kind will be given after this date, regardless of cause. Refunds will not be given for no-shows. Any changes to existing badges after the published cut-off date of September 14, 2017, are assessed a $50 processing fee.

CANCELLATION REQUESTS ACCEPTED VIA:

E-mail: cns@wyndhamjade.com
Fax: 972.349.7715
Mail: CNS Annual Meeting
CNS Registration and Housing Center
6100 West Plano Parkway
Suite 3500
Plano, TX 75093

HOTEL INFORMATION

Contact the official CNS Annual Meeting Registration and Housing Center to reserve your guest rooms.

Hotels will not accept reservations from CNS meeting attendees directly. Reservations can be made online or via fax, phone, or mail.

Visit cns.org/2017 to make your reservation today! Be sure to complete the entire housing section on the reservation form.

HOTEL RESERVATION INFORMATION AND DEADLINES

Hotel reservations are only available to registered CNS attendees. Rooms are subject to availability. Reserve your room by September 7, 2017.

DEPOSIT

A deposit of one night's room and tax is due at the time your hotel reservation is made. This payment will be charged to the credit card provided. Please make checks payable to: CNS Registration and Housing Center at, 6100 W. 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 September 26, based on availability. Please make any changes or cancellations through the CNS housing bureau, Wyndham Jade, through September 26. Beginning September 28, changes and cancellations must be made directly with your reserved hotel. Please refer to your housing confirmation for your individual hotel's cancellation policy.

BEGINNING SEPTEMBER 28, 2017

- All changes, cancellations, or questions regarding your reservation must be made directly with the hotel.
- If cancellation notice is not received according to the hotel policy, the deposit will be forfeited. Your individual hotel's cancellation policy can be found in your emailed confirmation.

COMPLIMENTARY HOUSING FOR CNS RESIDENT MEMBER ATTENDEES

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

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

- Complete and submit the Resident member housing application by July 7, 2017. Completed applications may be submitted via email: meetings@cns.org, fax: 847-240-0804, or mail: Congress of Neurological Surgeons, 10 North Martingale Rd., Suite 190, Schaumburg, IL 60173.
- Register for the 2017 CNS Annual Meeting by July 7, 2017.
- All residents enrolled in ACGME approved programs have been automatically given complimentary CNS Resident membership.

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

For complete resident housing application guidelines, please visit cns.org/2017/residents.

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.

Hotel Room Rates (All CNS hotels include complimentary guest room internet and access to the fitness center)	**Single/Double** (Excludes local/ state tax and fees)	**Single/Double** (Deposit amount inclusive of local/state tax and fees*)
Westin Boston Waterfront – Headquarters Hotel (connected to the BCEC)	$349	$399.43
Aloft Boston Seaport, a Starwood property (walking distance to the BCEC)	$319	$365.10
Courtyard Boston Downtown	$289	$330.76
DoubleTree Hotel Boston Downtown	$299	$342.21
Element Boston Seaport, a Starwood property (walking distance to the BCEC)	$319	$365.10
Four Seasons Hotel Boston	$495	$566.53
Hilton Boston Downtown/Faneuil Hall	$339	$387.99
Hyatt Regency Boston	$299	$342.21
InterContinental Boston	$389	$445.21
Omni Parker House	$329	$376.54
Renaissance Boston Waterfront (walking distance to the BCEC)	$359	$410.88
Seaport Hotel (walking distance to the BCEC)	$360	$412.02**

*Tax rates subject to change.
**An additional $3.00 service/hotel fee will be charged per room per night.

HOTEL INFORMATION

WESTIN BOSTON WATERFRONT

Headquarters Hotel

425 Summer Street, Boston, MA 02210

Connected to Boston Convention & Exhibition Center
Shuttle service only provided to and from dinner seminars and social events as applicable.

Amenities Include:
- New Balance gear-lending
- Indoor pool
- Business center
- Restaurants onsite
- Room service available
- Enterprise Rent-A-Car onsite

ALOFT BOSTON SEAPORT, A STARWOOD PROPERTY

410 403 D Street, Boston, MA 02210

0.3 miles to Boston Convention & Exhibition Center
Shuttle service is not provided

Amenities Include:
- Indoor Pool
- Dog friendly
- Coffee and bottled water in room
- Mini-fridge in room

COURTYARD BOSTON DOWNTOWN

275 Tremont Street, Boston, MA 02116

1.6 miles to Boston Convention & Exhibition Center
Complimentary shuttle service provided by the CNS beginning Saturday, October 7

Amenities Include:
- Coffee/tea in room
- Laundry onsite
- Valet dry cleaning

DOUBLETREE HOTEL BOSTON DOWNTOWN

821 Washington Street, Boston, MA 02111

1.8 miles to Boston Convention & Exhibition Center
Complimentary shuttle service provided by the CNS beginning Saturday, October 7

Amenities Include:
- Restaurant onsite
- Room service available
- Business center
- Laundry/valet service

ELEMENT BOSTON SEAPORT, A STARWOOD PROPERTY

395 D Street, Boston, MA 02210
0.2 miles to Boston Convention & Exhibition Center
Shuttle service is not provided

Amenities Include:
- Indoor pool
- Laundry service
- Fully equipped kitchenette
- Coffee and bottled water in room
- Dog Friendly

HILTON BOSTON DOWNTOWN/FANEUIL HALL

89 Broad Street, Boston, MA 02110

1.3 miles to Boston Convention & Exhibition Center
Complimentary shuttle service provided by the CNS beginning Saturday, October 7

Amenities Include:
- Restaurant onsite
- Room service available
- Business center
- Laundry/valet service
- Room service

FOUR SEASONS HOTEL BOSTON

200 Boylston Street, Boston, MA 02216

1.9 miles to Boston Convention & Exhibition Center
Complimentary shuttle service provided by the CNS beginning Saturday, October 7

Amenities Include:
- Indoor pool
- Business center
- Restaurant onsite
- Room service available

HYATT REGENCY BOSTON

1 Avenue De Lafayette, Boston, MA 02111

0.6 miles to Boston Convention & Exhibition Center
Complimentary shuttle service provided by the CNS beginning Saturday, October 7

Amenities Include:
- Restaurant onsite
- Room service available
- Indoor pool

HOTEL INFORMATION

INTERCONTINENTAL BOSTON

510 Atlantic Avenue, Boston, MA 02210

0.6 miles to Boston Convention & Exhibition Center
Complimentary shuttle service provided by the CNS beginning Saturday, October 7

Amenities Include:
- Restaurant onsite
- Room service available
- Business center

RENAISSANCE BOSTON WATERFRONT

606 Congress Street, Boston, MA 02210

0.5 miles to Boston Convention & Exhibition Center
Shuttle service is not provided

Amenities Include:
- Indoor pool
- Restaurant onsite
- Room service available

OMNI PARKER HOUSE

60 School Street, Boston, MA 02108

2.0 miles to Boston Convention & Exhibition Center
Complimentary shuttle service provided by the CNS beginning Saturday, October 7

Amenities Include:
- Restaurant onsite
- Room service available
- Dry cleaning

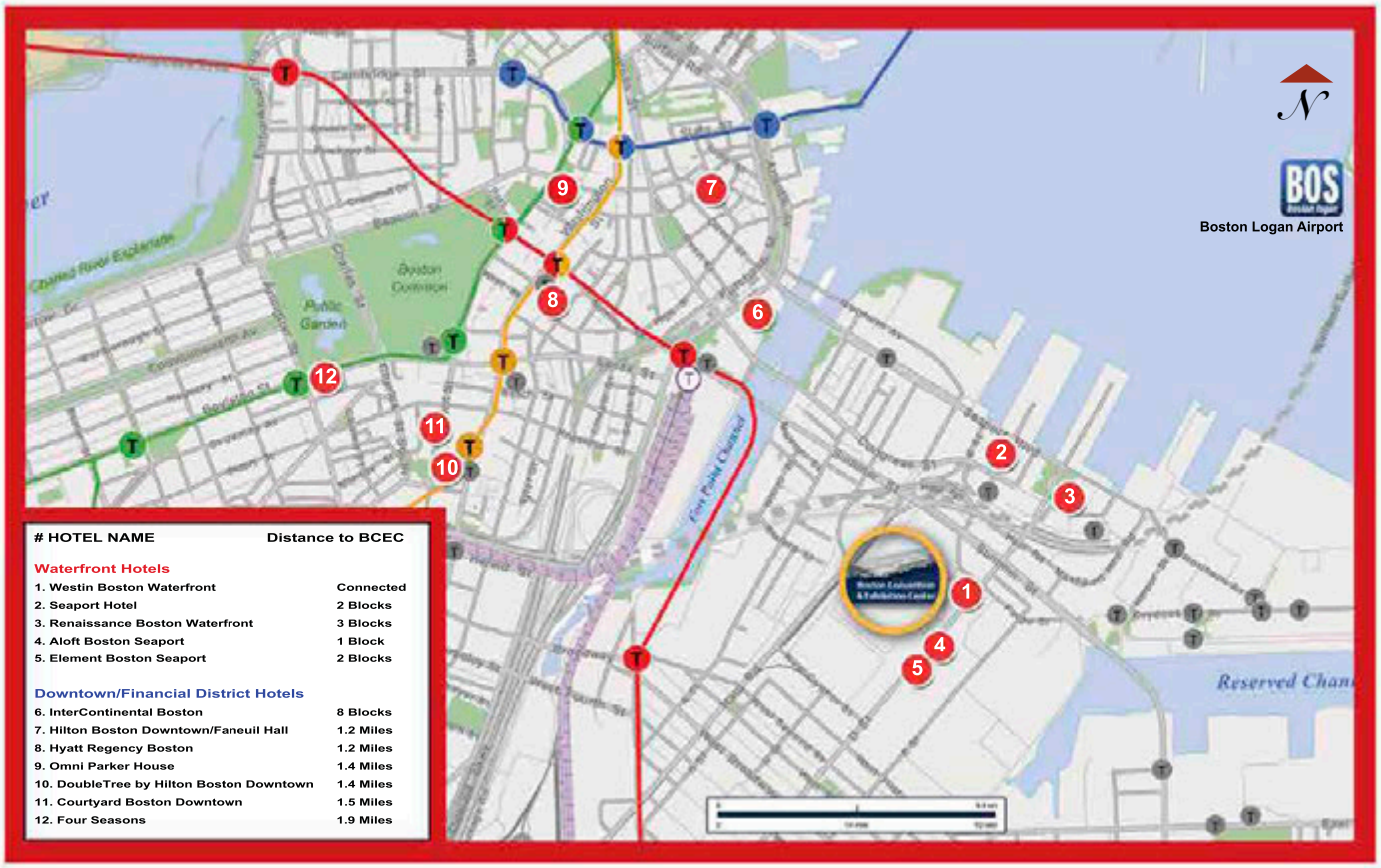
SEAPORT HOTEL

1 Seaport Lane, Boston, MA 02210

0.4 miles to Boston Convention & Exhibition Center
Shuttle service is not provided

Amenities Include:
- Indoor pool
- Restaurant onsite
- Room service available
- Business center
- Coffee/tea in room
- Mini-fridge in room
- Safe in room
- Pet friendly

AREA MAP



#	HOTEL NAME	Distance to BCEC
	Waterfront Hotels	
1	Westin Boston Waterfront	Connected
2	Seaport Hotel	2 Blocks
3	Renaissance Boston Waterfront	3 Blocks
4	Aloft Boston Seaport	1 Block
5	Element Boston Seaport	2 Blocks
	Downtown/Financial District Hotels	
6	InterContinental Boston	8 Blocks
7	Hilton Boston Downtown/Faneuil Hall	1.2 Miles
8	Hyatt Regency Boston	1.2 Miles
9	Omni Parker House	1.4 Miles
10	DoubleTree by Hilton Boston Downtown	1.4 Miles
11	Courtyard Boston Downtown	1.5 Miles
12	Four Seasons	1.9 Miles

Map Source: Boston Planning and Development Agency

2017 EXHIBITORS

CNS 2017 ANNUAL MEETING
BOSTON, MASSACHUSETTS
OCTOBER 7–11, 2017

As of 4/28/17

7D Surgical
Accuray, Incorporated
Aesculap, Inc
Alpha Omega Co. USA
American Association of Neurological Surgeons
Anatom-e
Apex Medical, Inc.
Arbor Pharmaceuticals
Arkis BioSciences
Barrier Technologies
Baylor Scott & White Health
Bien Air Surgery
Boss Instruments Ltd.
Boston Scientific
Brain Aneurysm Foundation
Bremer Group Co.
CAE Healthcare
Carl Zeiss Meditec, Inc.
ChoiceSpine
CMF Medicon Surgical Inc.
Codman Neuro
Collagen Matrix, Inc.
DePuy Synthes
Designs For Vision, Inc.
elliquence, LLC.
Elsevier, Inc.
Fehling Surgical Instruments, Inc.
Fiagon
FUJIFILM VisualSonics, Inc
Gauthier Biomedical Inc.
Haag-Streit
Hayes Locums
HCA
Hemedex
Hitachi Aloka Medical America, Inc.
HyperBranch Medical Technology Inc.
IMRIS
Integra
Intraoperative Neurophysiologic Monitoring Solutions (IOM Solutions)
InVivo Therapeutics
Joimax, Inc.
Journal of Neurosurgery
K2M, Inc.
Karl Storz Endoscopy - America, Inc.
Kirwan Surgical Products
KLS Martin
Kogent Surgical
Koros USA, Inc.
Legally Mine
Leica Microsystems
Life Instrument Corporation
Matrix Surgical USA
Mazor Robotics
Medical Practice Solutions LLC.
Medtronic, Inc.
MicroVention, Inc.
Mizuho America, Inc.
Mizuho OSI
Monteris Medical
MRI Interventions
Mutoh America Co., Ltd.
Nadia International, Inc.
Neuropace
NeuroPoint Alliance
Nevro
NICO Corporation
North American Neuromodulation Society (NANS)
North American Spine Society
NovaBone Products
Novocure, Inc.
NSK America Corp.
NuTech
Olympus America, Inc.
Orascoptic
OssDsign
OsteoMed
Panasonic System Communications Co. of North America
Paradigm BioDevices, Inc.
Paradigm Spine, LLC
Penumbra, Inc.
Peter Lazic U.S. Inc.
Pfizer
PMT Corporation
Poriferous
Pro Med Instruments, Inc.
Renishaw, Inc.
Rose Micro Solutions
RosmanSearch
RTI Surgical
Samsung
Sanford Health
Scanlan International
Shukla Medical
ShuntCheck Inc.
SI-BONE
Siemens Medical Solutions USA, Inc.
Sophysa
Specialist TeleMed
Spinal Simplicity
Spine Wave
Spineology
St. Jude Medical
Stryker
Surgical Theater
SurgiTel
Sutter Medical Technologies USA
Synaptive Medical
TeDan Surgical Innovations
Thieme Medical Publishers
Thompson Surgical
TMG Coins
University of Florida Health
Vertex Pharmaceuticals
Weatherby Healthcare
Wolters Kluwer Health
Zimmer Biomet
Zyga Technology