CONGRESS OF NEUROLOGICAL SURGEONS
1951
ERUDITIO OBSERVANTIA SOCIETAS

CNS

2016 ANNUAL MEETING

San Diego
CALIFORNIA
SEPTEMBER 24–28, 2016

Preliminary Program

Register at cns.org/2016
Advance Registration Deadline: August 25, 2016

The Congress of Neurological Surgeons welcomes

2016 International Partner

Graham Fieggen, MD
CAANS President

Continental Association of African Neurosurgical Societies (CAANS)

CAANS
Continental Association of African Neurosurgical Societies

The Congress of Neurological Surgeons welcomes

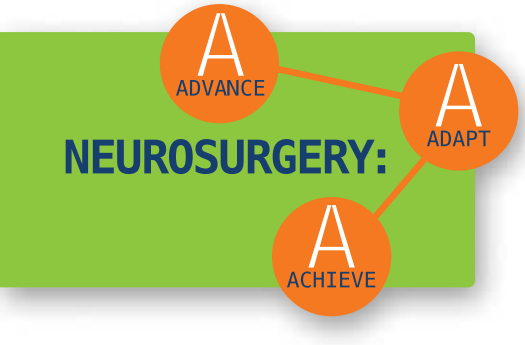
2016 Partner Society

California Association of Neurological Surgeons (CANS)

Praveen Mummaneni, MD
CANS President

President's Message

On behalf of the Congress of Neurological Surgeons Executive Committee, the Scientific Program Committee, and the 2016 CNS Honored Guest Edward H. Oldfield, MD, I invite you to attend this year's CNS Annual Meeting in San Diego, California, September 24-28, 2016.



With the theme *Advance, Adapt, Achieve,* this year's meeting is enhanced with an unprecedented number of innovations. We're bringing more clinically focused content, case-based presentations, and in-depth sessions on the pathologies and techniques critical to your practice.

ADVANCE

Gain a competitive edge with high-impact education in subspecialty and practice management topics. We continue to find innovative ways to deliver content, such as the new multi-platformed *Operative Neurosurgery* Sessions that connect the *ONS* journal with a state-of-the-art vascular replication system using 3D printing. We're also bringing back the popular daily live surgery sessions in the exhibit hall that put you in the center of the operating room.

ADAPT

The CNS Annual Meeting keeps you abreast of our rapidly changing health-care system with practical courses on implementing ICD-10 coding, developing your practice's online presence, and navigating the regulations that affect your hospital relationships and negotiations. Plus, our new Guidelines Sessions cover the latest evidence-based treatment of traumatic brain injury, brain metastases, and thoracolumbar fractures.

ACHIEVE

Recharge and reconnect with your peers at luncheon and dinner seminars and visit with more than 150 exhibiting companies representing the newest technologies in the field. For inspiration, we present an exciting lineup of guest speakers including Steve Wozniak, co-founder of Apple Computer, Inc.; legendary baseball executive Billy Beane; Sterling Professor of Law and Political Science Akhil Reed Amar; bestselling authors Daniel James Brown (*The Boys in the Boat*) and Viktor Mayer-Schönberg (*Big Data*); and Vice Admiral Mike Shoemaker.

We are honored to host the Continental Association of African Neurosurgical Societies (CAANS) as our international partner this year. CAANS represents African continental neurosurgery, and like the CNS, promotes global improvement in neurosurgical care. We are also delighted to welcome the California Association of Neurological Surgeons (CANS).

Please join me in San Diego, a wonderful vacation destination for you and your family. I look forward to seeing you at the 2016 CNS Annual Meeting.

Sincerely,
Russell R. Lonser, MD
CNS President

Contents

CNS

The purpose of the 2016 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 are welcome and encouraged to attend the 2016 CNS Annual Meeting.

2016 At-a-Glance

CNS 2016 ANNUAL MEETING

S 24 SATURDAY, SEPTEMBER 24

8:00 am–5:00 pm	Symposia 01: Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon
8:00 am–4:00 pm	Full Day Practical Course (PC01)
8:00–11:30 am	Morning Practical Courses (PC02-PC05)
12:30–4:00 pm	Afternoon Practical Courses (PC06-PC12)
5:00–6:30 pm	International Reception Marriott Marquis San Diego Marina
6:00–8:30 pm	Dinner Seminar (DIN01): Cervical Spondylotic Myelopathy

Su 25 SUNDAY, SEPTEMBER 25

8:00 am–4:00 pm	Symposia 02: Spinal Cord Stimulation: The Transformation
8:00 am–4:00 pm	Full Day Practical Courses (PC13–PC15)
8:00–11:30 am	Morning Practical Courses (PC16–PC23)
12:30–4:00 pm	Afternoon Practical Courses (PC24–PC33)
1:00–3:00 pm	CNS Resident SANS Challenge Preliminary Rounds
4:05–6:30 pm	General Scientific Session I Marriott Marquis San Diego Marina
6:30–8:30 pm	CNS Opening Reception Marriott Marquis San Diego Marina

M 26 MONDAY, SEPTEMBER 26

7:00–9:00 am	General Scientific Session II
9:00 am–3:00 pm	Exhibit Hall Open
9:00–10:00 am	Exhibit Hall Break
9:15–9:45 am	Live Surgery in the Exhibit Hall
10:00–11:30 am	General Scientific Session II, continued
11:45 am–1:15 pm	Luncheon Seminars (M01–M15)
11:45 am–1:15 pm	Industry Sponsored Lunch Symposia
1:15–2:15 pm	Exhibit Hall Break
2:15–3:15 pm	*Operative Neurosurgery* Session 1 Clinical Controversy Session 1 Guidelines Session 1
3:15–4:45 pm	Section Sessions and Oral Presentations
4:45–6:15 pm	Section Poster Viewing
4:45–6:15 pm	Clinical Trials Update Session
7:00–9:30 pm	Dinner Seminar (DIN02): New CPT Codes, ICD-10, MIPS, and Bundling: What These Challenges Mean to Your Bottom Line Dinner Seminar (DIN03): Management of Meningiomas (Asymptomatic to Atypical)

T 27 TUESDAY, SEPTEMBER 27

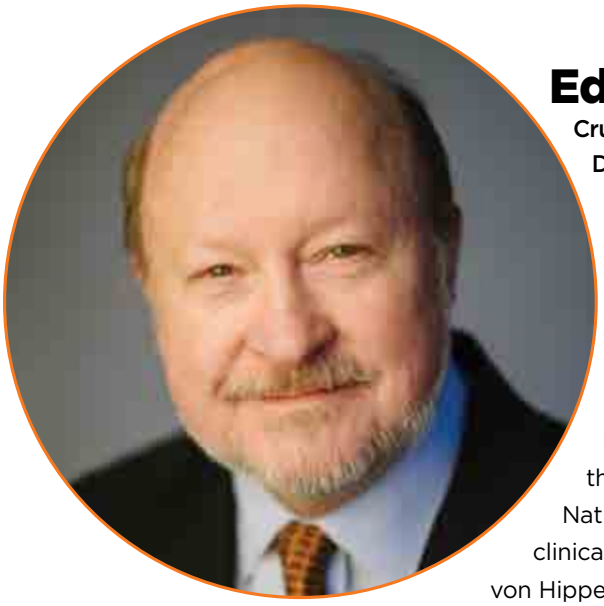
7:00–9:00 am	General Scientific Session III
9:00am–3:00 pm	Exhibit Hall Open
9:00–10:00 am	Exhibit Hall Break
9:15–9:45 am	Live Surgery in the Exhibit Hall
10:00–11:30 am	General Scientific Session III, continued
11:45 am–1:15 pm	Luncheon Seminars (T16–T30)
11:45 am–1:15 pm	Industry Sponsored Lunch Symposia
1:15–2:15 pm	Exhibit Hall Break
1:15–2:15 pm	Annual Business Meeting
1:45–3:15 pm	CNS Resident SANS Challenge Championship Round
2:15–3:15 pm	*Operative Neurosurgery* Session 2 Clinical Controversy Session 2 Guidelines Session 2
3:15–4:45 pm	Section Sessions and Oral Presentations
4:45–5:15 pm	Rapid-exchange Oral Presentations Sessions
5:15–6:15 pm	Section Poster Viewing
5:45–6:45 pm	Resident Recruitment Social
7:00–9:30 pm	Dinner Seminar (DIN04): Concussion: Diagnosis, Management and Outcomes

W 28 WEDNESDAY, SEPTEMBER 28

7:00–9:00 am	General Scientific Session IV
9:00 am–2:15 pm	Exhibit Hall Open
9:00–10:00 am	Exhibit Hall Break
9:15–9:45 am	Live Surgery in the Exhibit Hall
10:00–11:30 am	General Scientific Session IV, continued
11:45 am–1:15 pm	Luncheon Seminars (W31–W43)
11:45 am–1:15 pm	Industry Sponsored Lunch Symposia
1:15–2:15 pm	Exhibit Hall Break
2:15–3:15 pm	Clinical Controversy Session 3 Guidelines Session 3
3:15–3:45 pm	Rapid-exchange Oral Presentations Sessions

#CNS2016
Follow us on Twitter, Facebook, and LinkedIn for the latest information and meeting updates.

Honored Guest



Edward H. Oldfield, MD, FACS

Crutchfield Professor of Neurosurgery & Professor of Internal Medicine
Department of Neurological Surgery, University of Virginia

Edward Oldfield holds the Crutchfield Chair in Neurosurgery and is a professor of neurosurgery and internal medicine at the University of Virginia (UVA). He also leads a multidisciplinary effort in the treatment of pituitary tumors and contributes to the research program in the Department of Neurosurgery at UVA.

In 1986, Dr. Oldfield became chief of the Surgical Neurology Branch at the National Institute of Neurological Disorders and Stroke (NINDS) at the National Institutes of Health (NIH). At the NIH he led successful laboratory and clinical research efforts in the areas of brain and pituitary tumors, syringomyelia, von Hippel-Lindau disease, spinal arteriovenous malformations, pathophysiology and therapy of cerebral vasospasm after subarachnoid hemorrhage, and development of new drug delivery approaches for the central nervous system.

He is the author of over 500 original scientific and clinical contributions to medical literature and is the co-inventor of patents on convection-enhanced drug delivery and genetic therapy. His contributions to academic and organized neurosurgery include membership on the editorial boards of *Neurosurgery* and the *Journal of Neurosurgery,* where he recently completed a term of eight years as associate editor.

Dr. Oldfield has served as vice president and president of the Society of Neurological Surgeons (SNS). He has received numerous awards including the Public Health Superior Service Award, the Grass Medal for Meritorious Research in Neurological Science (SNS), the Farber Award (AANS), the Distinguished Alumnus Award, University of Kentucky Medical Alumni Association, the Harvey Cushing Medal (AANS), the first (2013) annual AANS Cushing Award for Technical Excellence and Innovation in Neurosurgery. In 2015 he received the Charles B. Wilson Award of the Joint Tumor Section for "for career achievement and substantial contributions to understanding and treatment of brain tumors."

Dr. Oldfield is married to Susan Wachs, and they are the proud parents of Caroline (1989).

Look for Dr. Oldfield at the following sessions:

M 26
8:40–9:00 am
Honored Guest Presentation: Cushing's Disease: Lessons Learned from 1400 Cases

11:45–1:15 pm
M01: Honored Guest Luncheon

T 27
8:17–8:37 am
Honored Guest Presentation: Pathogenesis of Chiari I Pathophysiology of Syringomyelia: Implications for Therapy

W 28
8:16–8:32 am
Honored Guest Presentation: Spinal Dural Arteriovenous Fistulas: 40 Years of Progress—Unanswered Issues

Featured Speakers

WALTER E. DANDY ORATOR

Steve Wozniak

Co-founder of Apple Computer Inc. and Philanthropist

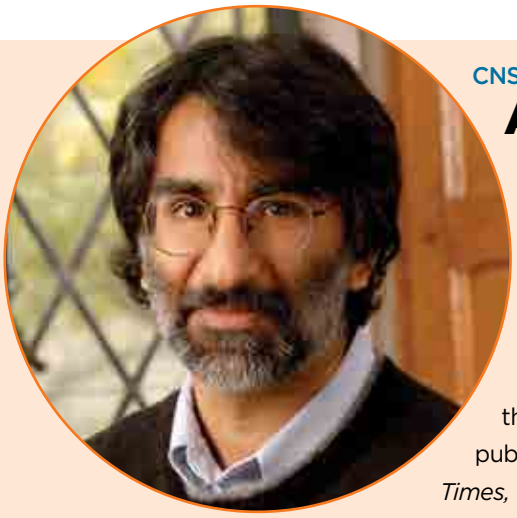
A Silicon Valley icon and philanthropist, Steve Wozniak helped shape the computing industry with his design of Apple's first line of products; the Apple I and II, and influenced the popular Macintosh. In 1976, Wozniak and Steve Jobs founded Apple Computer Inc. with Wozniak's Apple I personal computer.

For his achievements at Apple, Wozniak was awarded the National Medal of Technology by the President of the United States, the highest honor bestowed on America's leading innovators. He has been inducted into the Inventors Hall of Fame and was awarded the prestigious Heinz Award for Technology, The Economy and Employment. In 2014, he was inducted into the *IndustryWeek* Manufacturing Hall of Fame.

Wozniak is involved in various business and philanthropic ventures, focusing primarily on computer capabilities in schools and encouraging creativity for students. He founded the Electronic Frontier Foundation, and was the founding sponsor of the Tech Museum, Silicon Valley Ballet, and Children's Discovery Museum of San Jose.

Wozniak is Chief Scientist at Primary Data and authored the New York Times bestselling autobiography, *iWoz: From Computer Geek to Cult Icon.* Television appearances include *Kathy Griffin: My Life on the D-List, ABC's Dancing with the Stars*, and **The Big Bang Theory.**

M 27 **11:00–11:30 am**
General Scientific Session II iWoz: A Conversation with Steve Wozniak



CNS MICHAEL L. J. APUZZO LECTURER ON CREATIVITY AND INNOVATION

Akhil Reed Amar

Sterling Professor of Law and Political Science, Yale University

Akhil Reed Amar is a leading constitutional scholar. His work has won awards from the American Bar Association and the Federalist Society. He has been favorably cited by Supreme Court justices across the spectrum in over 30 cases, and he regularly testifies before Congress at the invitation of both parties.

He is a member of the American Academy of Arts and Sciences and received the DeVane Medal—Yale's highest award for teaching. He has written widely for publications such as *The New York Times, The Washington Post*, the *Los Angeles Times, The Atlantic,* and *Slate*. He consulted on the TV show, *The West Wing*, and his work has been showcased on *The Colbert Report, Charlie Rose,* and *The MHP Show*. He is also the author of several books, including *The Constitution and Criminal Procedure: First Principles, The Bill of Rights: Creation and Reconstruction, America's Constitution: A Biography, America's Unwritten Constitution: The Precedents and Principles We Live By,* and *The Law of the Land: A Grand Tour of our Constitutional Republic* (2015). His next book, *The Constitution Today: Timeless Lessons for the Issues of Our Era,* will be published in September.

Su 25 **5:47–6:07 pm**
General Scientific Session I 2016: The Constitution at a Crossroads

Featured Speakers

JOHN THOMPSON HISTORY OF MEDICINE LECTURER

Daniel James Brown

***New York Times* bestselling author**

Daniel James Brown is the *New York Times* bestselling author of *The Boys in the Boat: Nine Americans and Their Epic Quest for Gold at the 1936 Berlin Olympics.* The novelist grew up in the San Francisco Bay Area and attended the University of California at Berkeley. He taught writing at San Jose State University and Stanford before becoming a technical writer and editor, first in Silicon Valley and later at Microsoft. He now writes narrative nonfiction books full time. His primary interest as a writer is in bringing compelling historical events to life as vividly and accurately as he can. He lives in the country outside of Seattle, Washington, with his wife, two daughters, and an assortment of cats, dogs, chickens, and honeybees. When he is not writing, he is likely to be birding, gardening, fly fishing, reading American history, or chasing bears away from the bee hives.

Su 25

6:10–6:30 pm
General Scientific Session I

6:30-7:30 pm
Book signing at the CNS Opening Reception

NEUROSURGERY LECTURER

Billy Beane

Oakland A's Executive VP of Baseball Operations

Considered one of the most progressive and talented baseball executives in the game today, Billy Beane has molded the Oakland Athletics into one of professional baseball's most consistent winners since taking over as General Manager following the 1997 season.

Beane shattered traditional MLB beliefs that big payrolls equated wins by implementing a statistical methodology that led the Oakland A's, one of the worst teams in baseball with one of the lowest payrolls, to six American League West Division Titles. That strategic methodology has come to be known as the *Moneyball* philosophy, named for the bestselling book and Oscar-nominated film chronicling Beane's journey from General Manager to hero to celebrated management genius. Most recently, Beane was named Major League Baseball Executive of the Year for the second time by *Baseball America* in 2013 (first earned in 2002).

T 27

10:55–11:30 am
General Scientific Session III Moneyball: The Art of Winning an Unfair Game

Featured Speakers

Viktor Mayer-Schönberger

International bestselling author

Why is Big Data transforming the way we live, work and think? How will Big Data offer new sources of revenue to businesses, and how will organizations change in the Big Data age? These are just a few of the questions Viktor Mayer-Schönberger has addressed in over a hundred presentations since the publication of the internationally bestselling book he co-authored, *Big Data: A Revolution That Will Transform How We Live, Work, and Think.*

An acclaimed and sought-after keynote speaker, Mayer-Schönberger discusses Big Data's role in changing the face of everything from product development and scientific discovery, to human learning and health care, transportation, retail, finance and marketing. Mayer-Schönberger's media presence straddles international print media such as the *New York Times,* the *Wall Street Journal,* the *Guardian*, or *Die Zeit*, *Der Spiegel;* international broadcast media such as CNN, BCC, or PBS; and online media such as *Ars Technica, Daily Kos,* and *Wired*. More generally, he has spoken about the evolution of the information economy, and how our work and our lives change because of our digital tools and networks.

T 27

8:40–9:00 am
General Scientific Session III Big Data's Impact on Medicine

9:00-10:00 am
Book signing at the CNS booth in the Exhibit Hall

Vice Admiral Mike Shoemaker

Commander, Naval Air Forces

In January 2015, Vice Admiral Mike Shoemaker assumed command of Naval Air Forces, becoming naval aviation's seventh "Air Boss." His command is responsible for 10 aircraft carriers and their air wings, including 170 squadrons and more than 100,000 personnel. A native of St. Petersburg, Florida, he graduated with honors from the US Naval Academy in 1982 with a Bachelor of Science degree in systems engineering and was designated a naval aviator in July 1984.

Vice Admiral Shoemaker most recently served as commander, Naval Air Force Atlantic (AIRLANT). He also served as aide to the vice chief of Naval Operations and Commander, US Pacific Command, was assigned to Navy Personnel Command, and was executive assistant to Commander, US Pacific Fleet. As a flag officer, he served as assistant commander, Navy Personnel Command for Career Management. Vice Admiral Shoemaker has accumulated more than 4,400 flight hours, primarily in the A-7E Corsair and the F/A-18C Hornet, and has 1,066 carrier-arrested landings. His commands include Strike Fighter Squadron (VFA) 105, VFA-106, Carrier Air Wing 17, Carrier Strike Group (CSG) 9, and CSG 3. His personal decorations include the Legion of Merit (6), Defense Meritorious Service Medal, Meritorious Service Medal (3), Air Medal (3), and other personal, campaign, and service ribbons.

Su 25

4:51–5:11 pm
General Scientific Session I

Annual Meeting Leadership

PRESIDENT

Russell R. Lonser, MD

Dr. Lonser is professor and chair of the Department of Neurological Surgery at Ohio State University. He earned his MD from Loma Linda University and received his neurosurgical training at the University of Utah. During his residency, he completed a research fellowship in the Surgical Neurology Branch at the National Institutes of Health (NIH). Upon completion of his residency, he joined the staff of the Surgical Neurology Branch at the NIH. He became chief of the Surgical Neurology Branch in 2007 where he started the NIH Neurological Surgery Residency Training Program, before moving to Ohio State University in 2012.

Dr. Lonser's research interests include the development of drug delivery paradigms for the central nervous system pathology, as well as investigation of tumor pathogenesis and biology. His clinical and surgical interests are centered on the treatment of brain, skull base, and spinal cord tumors. He is an author on over 250 scientific and clinical publications. He received the Young Investigator Award in 2001 and Mahaley Clinical Research Award in 2013 from the Joint Section on Tumors. He is co-inventor on a patent for imaging delivery of therapeutic agents in the nervous system.

He has served the Congress of Neurological Surgeons as a member-at-large of the Executive Committee, scientific meeting chair, annual meeting chair, and treasurer. He also served on the Executive Committee for the Joint Section on Tumors. He chairs the research sub-committee of the National Football League Head, Neck and Spine Injury Committee. He has been actively involved in the mentoring and training of over 40 neurosurgical fellows. He is on the editorial boards for *Neurosurgery, World Neurosurgery,* and *Journal of Neurosurgery*. He is an academic editor for *PLoS One* and *Science Reports* and is consulting editor for *Neurosurgery Clinics of North America*.

Dr. Lonser is married to Carolyn, and they have three daughters, Hannah (2001), Sarah (2004), and Alicia (2007).

PRESIDENT-ELECT

Alan M. Scarrow, MD, JD

Dr. Scarrow is a staff neurosurgeon and president of the Mercy Health System in Springfield, Missouri. He is a graduate of the medical and law schools at Case Western Reserve University and completed his neurosurgery residency at the University of Pittsburgh in 2003. During his residency he spent a year in Washington, DC, working in the US Senate as part of the Congress of Neurological Surgeons (CNS) Public Policy Fellowship. Dr. Scarrow is married to Meera Scarrow, who is an OB/GYN at Mercy Clinic in Springfield. They have three children, Evelyn, William, and Harrison. They enjoy working on their farm in their free time.

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ANNUAL MEETING CHAIR

Steven N. Kalkanis, MD

Dr. Kalkanis is professor and chair of the Department of Neurosurgery and co-director of the Neuroscience Institute at Henry Ford Health System in Detroit, Michigan, where he also serves as Director of the Henry Ford Cancer Center. Dr. Kalkanis joined Henry Ford in 2004 after completing his neurosurgical training at Massachusetts General Hospital. He graduated with highest honors from Harvard University, where he was awarded the John Harvard Scholarship, and then Harvard Medical School, where he served as class marshal and received the Linnane Prize for highest academic achievement.

In 2009, Dr. Kalkanis led a multidisciplinary team of experts to publish the first and largest guideline to date in organized neurosurgery on the clinical treatment pathways for metastatic brain tumors. Since that time, he has chaired the guidelines efforts of the Joint Section on Tumors and was the founding chair of the CNS Guidelines Committee. Dr. Kalkanis also serves as a vice-chair on the Joint Guidelines Committee and has helped to spearhead ten separate clinical practice guidelines in a myriad of neurosurgical topics. Dr. Kalkanis has served on the CNS Executive Committee since 2009, and was recently elected as Chair for the Section on Tumors.

With the goal of refining future personalized medicine treatment protocols, and as the Mark Rosenblum Endowed Chair in Neurosurgery, Dr. Kalkanis runs a funded translational research laboratory investigating the molecular genetic differences between short-and long-term glioma survivors. Specializing in brain tumor surgery, he has been involved in numerous clinical trials for brain tumors and has authored over 100 peer-reviewed publications.

Steve and his wife, Laurel, enjoy traveling with and cheering on their three children, Nicholas, Connor, and Grace, in multiple sporting, scouting, and musical activities.

SCIENTIFIC PROGRAM 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 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 6-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 230 peer-reviewed publications and over 120 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.

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

Annual Meeting Committee

Annual Meeting Chair
Steven N. Kalkanis, MD

Scientific Program Chair
James S. Harrop, MD, FACS

Vice Scientific Program Chair
Brian L. Hoh, MD

Basic Science
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Kareem Zaghloul, MD, PhD
Kristopher Kahle, MD, PhD
Manish Aghi, MD, PhD
Nicholas Boulis, MD
Shahid Nimjee, MD, PhD
William Curry, MD

Continental Association of African Neurosurgical Societies and International Partner
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Edjah Nduom, MD
Graham Fieggen, MD
Michael du Trevou, MD
Mustafa Baskaya, MD
Nelson Oyesiku, MD, PhD, FACS
Shekar Kurpad, MD, PhD

Clinical Controversies and Late Breaking Abstracts
Bill Mack, MD
Glen Manzano, MD
Kelly Foote, MD
Ricardo Komotar, MD
Todd Hankinson, MD, MBA
Zach Hickman, MD

Dinner Seminars
Brian Ragel, MD
Ian Lee, MD
Krystal Tomei, MD, MPH
Michael Steinmetz, MD

Exhibit Hall
John Ratliff, MD, FACS

Guidelines and Update Sessions
Brian Hoh, MD
Geoffrey Manley, MD, PhD
Jeffrey Olsen, MD
Jennifer Sweet, MD
John O'Toole, MD, MS
Kevin Cockroft, MD
Lissa Baird, MD
Sepideh Amin Hanjani, MD, FACS, FAHA
Steven Kalkanis, MD
Tim Ryken, MD, MS, FACS

Live Surgery
Elad Levy, MD, FACS, FAHA
Daniel Prevedello, MD

Luncheon Seminars
Bernard Bendok, MD, FACS
J. Bradley Elder, MD
Chen Wu, MD, MS
Christopher Neal, MD
Ciaran Powers, MD, PhD
Erol Veznedaroglu, MD
Joseph "Jody" Miller, MD
Joshua Beardsley, PA-C
Julie Pilitsis, MD, PhD
Lynda Yang, MD, PhD
Paul Klimo, MD, MPH

Neurosurgery
Gerald Grant, MD
Nelson Oyesiku, MD, PhD, FACS

Posters
Daniel Sciubba, MD
Edward Smith, MD
Ekkehard Kasper, MD, PhD
Frank Farhadi, MD
Jody Leonardo, MD
Joseph Neimat, MD, MS
Nicholas Bambakidis, MD
Patrick Youssef, MD
Shawn Hervey-Jumper, MD

Practical Courses and Special Symposia
Nadar Pouratian, MD, PhD
Manish Aghi, MD, PhD
Jeffrey Leonard, MD
Jonas Sheehan, MD, FACS
Michael Wang, MD, FACS
Paul Larson, MD

Private Practice Management
Christopher Abood, MD, BS
George Bovis, MD
Matthew McGirt, MD

Scientific Advisors
Mustafa Baskaya, MD
Paul Gardner, MD
Christopher Maulucci, MD
Nadar Pouratian, MD, PhD

Sergeant-at-Arms
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Michael Lang, MD

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Ahmed Raslan, MBBS MCh
Bernard Bendok, MD, FACS

Association of Physician Neurosurgical Assistants
Josh Beardsley, PA-C

Advance Practice Provider CME Liaison
Andrea Strayer, MS, NP

SECTION REPRESENTATIVES

Council of State Neurosurgical Societies
Clemens Shirmer, MD, PhD
Michael Steinmetz, MD

Section on Cerebrovascular Surgery
Adam Arthur, MD, MPH, FACS
Phil Taussky, MD
Sepideh Amin-Hanjani, MD, FACS, FAHA

Section on Disorders of the Spine and Peripheral Nerves
Ali Baaj, MD
Ehud Mendel, MD
Lynda Yang, MD, PhD
Marcella Madera, MD
R. John Hurlbert, MD, PhD, FACS, FRCS(C)

Section on Neurotrauma and Critical Care
Craig Rabb, MD
David Okonkwo, MD, PhD

Section on Pain
Jason Schwalb, MD, FACS
Jonathan Miller, MD

Section on Pediatric Neurological Surgery
Andrew Jea, MD
Joshua Chern, MD, PhD

Section on Stereotactic and Functional Neurosurgery
Aviva Abosch, MD, PhD
Brian Kopell, MD
Robert Gross, MD, PhD

Section on Tumors
Ekkehard Kasper, MD, PhD
Ian Lee, MD

Women in Neurosurgery (WINS)
Uzma Samadani, MD

CME/Education Chair
Bernard A. Bendok, MD, FACS

Resident Liaison
Krystal Tomei, MD, MPH
Michael Lang, MD

The Exhibit Hall

Technology in Action

The Exhibit Hall is the place to learn, explore, network, and find solutions for your practice. With more than 160 leading companies in attendance, the exhibit hall is the best way to see all the latest advances in one place. Take advantage of opportunities to see how leading subspecialty experts utilize the latest product innovations and be sure to try out new devices for yourself.

In-booth demonstrations provide opportunities to get hands on with the newest technologies and devices!

Best Times to Visit the Exhibit Hall

Morning Break | 9:00–10:00 am

DAILY LIVE SURGERY PRESENTATIONS VIA TELEMEDICINE TECHNOLOGY

The centerpiece of the Exhibit Hall is our Live Surgery Theater, where surgeons at some of the top institutions in the US will operative live via telemedicine, giving you the chance to observe and ask questions of the operating surgeon.

Sponsored by

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Lunch Break | 11:45 am–1:15 pm

DAILY SPONSORED LUNCH AND LEARN SESSIONS WITH INDUSTRY LEADERS

Connect with peers and enjoy a complimentary lunch from our corporate partners. Led by neurosurgeon faculty, these educational presentations cover important clinical topics.

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SYNAPTIVE MEDICAL

ZEISS

Afternoon Break | 1:15–2:15 pm

EDUCATIONAL UPDATE & LEADERSHIP IN HEALTHCARE UPDATE SESSIONS

Grab a beverage and catch up on the latest developments in your subspecialty with quick 10-minute daily presentations by our valued corporate partners.

On Monday, catch the planning session for a live surgery presentation featuring the impressive SNAP 3D virtual reality system from Surgical Theater. Join Medtronic Tuesday and Wednesday afternoon for a 30-minute discussion on key ways to influence and become a leader in your workplace.

Sponsored by

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SURGICAL THEATER

VISIT CNS.ORG/2016 FOR BREAKING UPDATES!

Details on all sessions will be available on the CNS Annual Meeting App this summer!

SUBSPECIALTY SESSION TRACKS

CV = Cerebrovascular

PRACTICAL COURSES

PC02: Cerebrospinal Fluid Abnormalities Update (Chiari, Pseudotumor, Hydrocephalus): Case-based Learning *(page 18)*

SYM01: Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon *(page 17)*

PC12: Neurocritical Care and Neurosurgical Emergencies Update *(page 20)*

PC19: Advanced Cerebrovascular Surgery: 2D and 3D Operative Video-based Surgical and Anatomical Pearls *(page 25)*

LUNCHEON SEMINARS

M05: Intraoperative Vascular Complications—Prevention and Management *(page 32)*

M09: Brain Arteriovenous Malformation: Multi-disciplinary Approach *(page 33)*

T16: Seven Aneurysms *(page 40)*

T28: Guidelines for Management of ICH and IVH *(page 41)*

T30: Carotid Disease Management *(page 41)*

W32: Lessons Learned: Avoidance and Management of Complications of Aneurysm Surgery *(page 48)*

W34: Hematology and Coagulation for Neurosurgeons: Dangers and Solutions *(page 48)*

W41: Hemorrhagic Stroke for Neurosurgeons *(page 49)*

AFTERNOON SESSIONS

Operative Neurosurgery Session 1: Live Neuroendovascular Surgery: Novel Devices and Treatment Controversies *(page 34)*

Clinical Controversy Session 2: Clinical Controversies: Intraparenchymal Hemorrhage *(page 42)*

Cerebrovascular Section Sessions and Oral Presentations occur Monday (page 35) and Tuesday (page 43) afternoon

TR = Neurotrauma and Critical Care

PRACTICAL COURSES

PC12: Neurocritical Care and Neurosurgical Emergencies Update *(page 20)*

PC22: Trauma Update Part I: Traumatic Brain Injury—Case-based Learning *(page 25)*

PC31: Spinal Trauma Cased-Based Guidelines Update *(page 27)*

PC32: Sports-related Head and Spinal Cord Injury: Return to Play and Other Management Considerations *(page 27)*

LUNCHEON SEMINARS

M02: Athletic Head Injuries: Return to Play *(page 32)*

T21: Guidelines for Neurocritical Care Management *(page 40)*

T29: Managing Intracranial Pressure in the Trauma Patient *(page 41)*

W36: Neurovascular Emergencies: Case-based Discussion *(page 48)*

W38: Pediatric Head Trauma and Sports *(page 48)*

AFTERNOON SESSION

Guidelines Session 1: Guidelines for the Management of Traumatic Brain Injury *(page 34)*

DINNER SEMINAR

DIN04: Concussion: Diagnosis, Management, and Outcomes *(page 45)*

Neurotrauma Section Sessions and Oral Presentations occur Monday (page 35) and Tuesday (page 43) afternoon

PA = Pain

PRACTICAL COURSE

SYM02: Spinal Cord Stimulation: The Transformation *(page 23)*

LUNCHEON SEMINARS

M14: Functional Neurosurgery: Emerging Opportunities *(page 33)*

T17: Trigeminal Neuralgia Management Update *(page 40)*

Pain Section Sessions and Oral Presentations occur Monday (page 35) and Tuesday (page 43) afternoon

SP = Spine and Peripheral Nerves

PRACTICAL COURSES

PC05: Minimally Invasive Spine Surgery: What You Know and Where We Need to Go *(page 18)*

PC07: Peripheral Nerve Surgical Exposures and Techniques *(page 19)*

PC10: Cervical Degenerative Case Management *(page 19)*

PC11: My Worst Spine Complication: Case-based Examples and What I Learned *(page 20)*

PC12: Neurocritical Care and Neurosurgical Emergencies Update *(page 20)*

SYM02: Spinal Cord Stimulation: The Transformation *(page 23)*

PC20: Spinal Deformity: Case-based Update *(page 25)*

PC21: Thoracolumbar: Trauma, Tumor, and Degenerative: Case-based Presentations *(page 25)*

PC25: Spinal Biomechanics in Clinical Practice *(page 26)*

PC31: Spinal Trauma Cased-based Guidelines Update *(page 27)*

LUNCHEON SEMINARS

M03: Guidelines for Lumbar Spine Degenerative Disease *(page 32)*

M04: Controversies in Spinal Deformity Surgery *(page 32)*

M06: Peripheral Nerve Pain Syndromes: Diagnosis and Management *(page 32)*

M10: Spinal Cord Stimulator for Back and Leg Pain: Show Me the Evidence *(page 33)*

M12: Spinal Column Metastases Management *(page 33)*

M15: Cervical Radiculopathy: Anterior Versus Posterior Cervical *(page 33)*

T18: Cervical Arthroplasty: Is There a Role? *(page 40)*

T20: Managing Complications in Spine Surgery *(page 40)*

T22: Peripheral Nerve Board Review *(page 40)*

T27: Managing Degenerative Thoracic Spine Disease *(page 41)*

W31: Guidelines for Acute Cervical Spine and Cord Injuries *(page 48)*

W37: Guidelines for Managing the Aging Spine *(page 48)*

W39: Minimally Invasive Deformity: New Frontiers *(page 48)*

AFTERNOON SESSIONS

Clinical Controversy Session 1: L4/5 Lumbar Spondylolithesis *(page 34)*

Guidelines Session 3: Guidelines for the Management of Thoracolumbar Fractures *(page 49)*

DINNER SEMINAR

DIN01: Cervical Spondylotic Myelopathy *(page 20)*

Spine and Peripheral Nerves Section Sessions and Oral Presentations occur Monday (page 35) and Tuesday (page 43) afternoon

PE = Pediatric

LUNCHEON SEMINARS

M08: Challenging Pediatric Neurosurgery Cases: Interactive Case-based Discussion *(page 32)*

T25: Pediatric and Adult Moyamoya Disease *(page 41)*

W35: Chiari Malformation *(page 48)*

W38: Pediatric Head Trauma and Sports *(page 48)*

Pediatric Section Sessions and Oral Presentations occur Monday (page 36) and Tuesday (page 43) afternoon

SF = Stereotactic and Functional

PRACTICAL COURSE

PC27: Laser Ablation Surgery: Opportunities, Indications, Technique, and Outcome *(page 26)*

LUNCHEON SEMINARS

M14: Functional Neurosurgery: Emerging Opportunities *(page 33)*

W42: Epilepsy: Current and Emerging Treatment Strategies *(page 49)*

AFTERNOON SESSION

Clinical Controversy Session 3: Epilepsy Associated Cavernomas *(page 49)*

Stereotactic and Functional Section Sessions and Oral Presentations occur Monday (page 36) and Tuesday (page 44) afternoon

SUBSPECIALTY SESSION TRACKS

TU = Tumor

PRACTICAL COURSES

PC01: Comprehensive Endoscopic Skull Base Surgery: Hands On Cadaver Course—Part 1 *(page 18)*

PC04: Surgical Management of Eloquent Area Tumors: Functional Mapping and/or Navigation *(page 18)*

PC06: Complex Skull Base and Brain Tumor Surgery: 3D Surgical Anatomy and Technical Nuances *(page 19)*

PC08: Brain Metastases: Case-Based Approach to Surgery, Radiosurgery, and Laser Ablation *(page 19)*

PC15: Comprehensive Endoscopic Skull Base Surgery: Hands-on Cadaver Course—Part 2 *(page 24)*

PC17: Cased-based Approach for Surgery/SRS for Malignant Tumors *(page 24)*

PC18: Surgical Neuroanatomy I (Supratentorial) *(page 25)*

PC24: Pituitary Surgery: Indications, Techniques, and Outcomes *(page 26)*

PC28: Surgical Neuroanatomy II (Infratentorial) *(page 27)*

PC30: My Worst Cranial Complication: Case-based Examples and What I Learned *(page 27)*

PC33: Surgery/SRS for Benign Tumors *(page 28)*

LUNCHEON SEMINARS

M07: Non-functioning Pituitary Adenomas: Operative Nuances and Management *(page 32)*

M11: Acoustic Neuroma: Current Management Strategies *(page 33)*

M13: Low Grade Glioma: Current Management Strategies *(page 33)*

T19: Radiosurgery for Brain Metastases: Update and Controversies *(page 40)*

T23: Mapping for Eloquent Tumors *(page 40)*

T24: Malignant Glioma: Advances in Surgery and Adjuvant Therapy *(page 40)*

T26: Meningioma: Management Strategies *(page 41)*

W33: Skull Base Endoscopy: Utility and Limitations *(page 48)*

W34: Hematology and Coagulation for Neurosurgeons: Dangers and Solutions *(page 48)*

AFTERNOON SESSION

Guidelines Session 2: Guidelines for the Management of Brain Metastases *(page 42)*

Operative Neurosurgery Session 2: Live Endoscopic Endonasal Resection of Nonsecretory Pituitary Macroadenoma *(page 42)*

DINNER SEMINAR

DIN03: Management of Meningiomas (Asymptomatic to Atypical) *(page 37)*

Tumor Section Sessions and Oral Presentations occur Monday (page 36) and Tuesday (page 44) afternoon

SPECIAL INTEREST SESSION TRACKS

RE = Resident

PRACTICAL COURSES

PC03: Leadership Development for the Practicing Neurosurgeon *(page 18)*

PC10: Cervical Degenerative Case Management *(page 19)*

PC12: Neurocritical Care and Neurosurgical Emergencies Update *(page 20)*

PC14: ABNS Primary Examination High Yield Review *(page 24)*

PC18: Surgical Neuroanatomy I (Supratentorial) *(page 25)*

PC21: Thoracolumbar: Trauma, Tumor and Degenerative: Case-based Presentations *(page 25)*

PC22: Trauma Update Part I: Traumatic Brain Injury—Case-based Learning *(page 25)*

LUNCHEON SEMINARS

M01: Honored Guest Luncheon (Complimentary to CNS Resident members) *(page 32)*

M03: Guidelines for Lumbar Spine Degenerative Disease *(page32)*

M09: Brain Arteriovenous Malformation: Multi-disciplinary Approach *(page 33)*

M10: Spinal Cord Stimulator for Back and Leg Pain: Show Me the Evidence *(page 33)*

M11: Acoustic Neuroma: Current Management Strategies *(page 33)*

M12: Spinal Column Metastases Management *(page 33)*

M13: Low Grade Glioma: Current Management Strategies *(page 33)*

M14: Functional Neurosurgery: Emerging Opportunities *(page 33)*

M15: Cervical Radiculopathy: Anterior Versus Posterior Cervical *(page 33)*

T16: Seven Aneurysms *(page 40)*

T22: Peripheral Nerve Board Review *(page 40)*

T29: Managing Intracranial Pressure in the Trauma Patient *(page 41)*

T30: Carotid Disease Management *(page 41)*

W34: Hematology and Coagulation for Neurosurgeons: Dangers and Solutions *(page 48)*

W35: Chiari Malformation *(page 48)*

W40: From Residency to Practice: Getting the Job You Want and What to Ask For *(page 48)*

W43: Women in Neurosurgery (WINS): Becoming a Neurosurgery Leader: Mentorship *(page 49)*

AP = Advanced Practice Provider

PRACTICAL COURSES

PC02: Cerebrospinal Fluid Abnormalities Update (Chiari, Pseudotumor, Hydrocephalus): Case-based Learning *(page 18)*

PC05: Minimally Invasive Spine Surgery: What You Know and Where We Need to Go *(page 18)*

PC12: Neurocritical Care and Neurosurgical Emergencies Update *(page 20)*

PC13: ANSPA Annual Fall CME Meeting: Presented in Collaboration with the CNS *(page 24)*

PC21: Thoracolumbar: Trauma, Tumor and Degenerative: Case-based Presentations *(page 25)*

PC22: Trauma Update Part I: Traumatic Brain Injury—Case-based Learning *(page 25)*

PC26: Improve Quality, Reduce Cost, and Increase Revenue *(page 26)*

PC32: Sports-Related Head and Spinal Cord Injury: Return to Play and Other Management Considerations *(page 27)*

SE = Socioeconomic

PRACTICAL COURSES

PC03: Leadership Development for the Practicing Neurosurgeon *(page 18)*

PC09: CPT Coding and All You Need for ICD-10 *(page 19)*

PC16: eNeurosurgery: Adapting Your Practice for 2016 and Beyond *(page 24)*

PC23: Neurosurgeon-Hospital Relationships: Options, Negotiations, and Achieving What You are Worth *(page 26)*

PC26: Improve Quality, Reduce Cost, and Increase Revenue *(page 26)*

PC29: Planning for Your Future—From 35–100: Strategic Planning, Economics, Marriage, Family, Illness and More. Should You Retire? *(page 27)*

LUNCHEON SEMINAR

W40: From Residency to Practice: Getting the Job You Want and What to Ask For *(page 48)*

DINNER SEMINAR

DIN02: New CPT Codes, ICD-10, MIPS, and Bundling: What These Challenges Mean to Your Bottom Line *(page 37)*

The Council of State Neurosurgical Socieities Sessions occur Monday (page 35) and Tuesday (page 43) afternoon

SATURDAY, SEPTEMBER 24

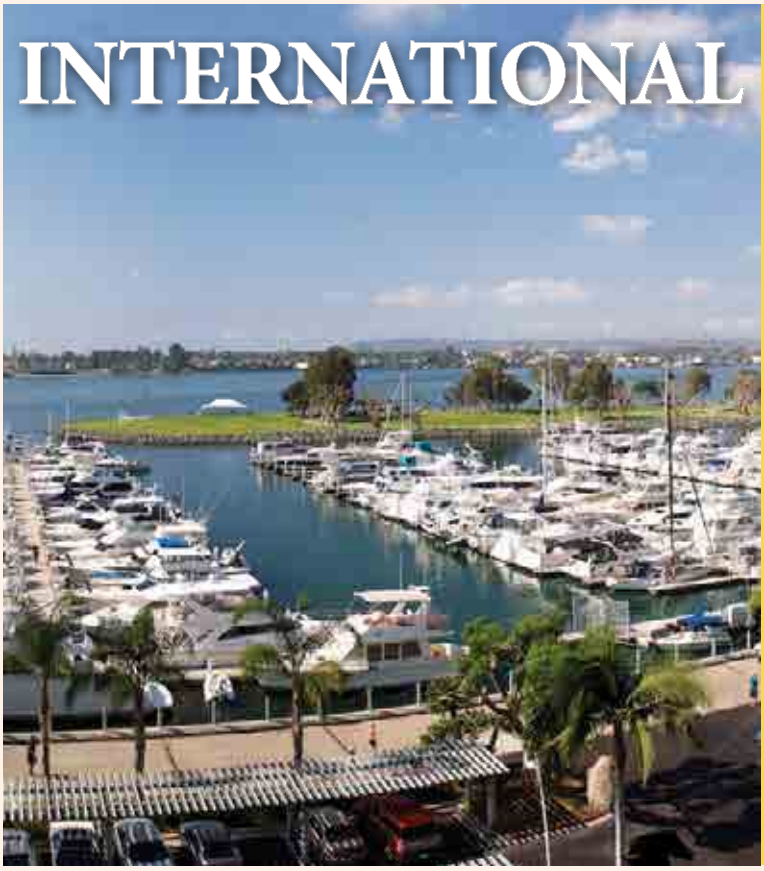
PROGRAM HIGHLIGHTS

8:00 AM–5:00 PM
SYM01
NEUROVASCULAR UPDATE:
Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon

8:00 AM–4:00 PM
PRACTICAL COURSES
PC01–PC12

5:00–6:30 PM
INTERNATIONAL RECEPTION

6:00–8:30 PM
DINNER SEMINAR
DIN01: Cervical Spondylotic Myelopathy



INTERNATIONAL RECEPTION

Marriott Marquis San Diego Marina
Saturday, September 24
5:00–6:30 pm

Join your colleagues from around the world at the exciting 2016 International Reception.

Take in breathtaking views of the San Diego Bay while enjoying delicious hors d'oeuvres and cocktails.

All international attendees and their registered guests are invited to attend.

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

SYMPOSIUM 01

CV 8:00 am–5:00 pm Fee: $300

SYM01: Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon

COURSE DIRECTORS: Peter Kan, Adnan H. Siddiqui

SPEAKERS: Ali Alaraj, Sepideh Amin-Hanjani, Adam S. Arthur, Bernard R. Bendok, Mandy Jo Binning, Alexander Lewis Coon, Ricardo A. Hanel, Brian Lim Hoh, Peter Kan, Alexander Arash Khalessi, Michael T. Lawton, Elad I. Levy, R. Loch Macdonald, J D. Mocco, Jacques J. Morcos, Christopher S. Ogilvy, Bruce E. Pollock, Adnan H. Siddiqui, Kenneth V. Snyder, Gary K. Steinberg, Michael F. Stiefel, Stavropoula I. Tjoumakaris, Raymond D. Turner, Babu Guai Welch

COURSE DESCRIPTION: This symposium provides a forum for attendees to obtain the latest information about current endovascular therapy for acute ischemic stroke. We will review recent literature regarding patient selection for endovascular stroke therapy as well as endovascular and surgical revascularization (endovascular versus EC-IC bypass) for intracranial atherosclerotic or vaso-occlusive diseases. In addition, we will discuss endovascular and surgical revascularization (CAS versus CEA) for extracranial atherosclerotic or vaso-occlusive diseases. The course will also cover optimal treatment of intracranial aneurysms, including flow diversion and other new technologies, and the optimal treatment options of intracranial arteriovenous malformations, dural arteriovenous fistulas, and intracerebral hemorrhage.

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

- Review recent clinical trials on endovascular therapy for acute ischemic stroke.
- Discuss patient selection and ongoing research on endovascular and surgical revascularization (endovascular versus EC-IC bypass) for intracranial atherosclerotic or vaso-occlusive diseases.
- Interpret recent clinical trials on endovascular and surgical revascularization (CAS versus CEA) for extracranial atherosclerotic or vaso-occlusive diseases.
- Apply recent literature on flow diversion and new technologies to treatment of intracranial aneurysms in their own practices.
- Identify the spectrum of treatment options for intracranial arteriovenous malformations and dural arteriovenous fistulas.
- Review evidence-based guidelines in the treatment of intracerebral hemorrhage.

8:00–8:15 am
Welcome
Peter Kan, Adnan H. Siddiqui

8:15–9:00 am
Didactic Session 1: Patient Selection and Advanced Imaging for Acute Stroke Intervention: An Update

8:15–8:30 am
Who Should We Select for Endovascular Stroke Therapy: State-of-the-Art Evidence
Raymond D. Turner

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

8:45–9:00 am
Wake Up Stroke: Where Are We
Mandy Jo Binning

9:00–9:30 am
Morning Breakout Session with Penumbra

9:30–10:15 am
Didactic Session 2: Interventional Therapy for Stroke: An Update

9:30–9:45 am
Where Should We Select Patients for Endovascular Stroke Therapy? Emergency Room, Ambulance, or the Angio Suite?
Adam S. Arthur

9:45–10:00 am
Endovascular Therapy for Posterior Circulation Stroke
Elad I. Levy

10:00–10:15 am
Glaring Gaps in Current Understanding and Role for New Technologies
Adnan H. Siddiqui

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

10:45–11:30 am
Didactic Session 3: Management of Intracranial Atherosclerotic and Vaso-occlusive Disease: An Update

10:45–11:00 am
Interventional Management for ICAD: Who and How?
Alexander Arash Khalessi

11:00–11:15 am
EC-IC Bypass for Moyamoya Disease
Gary K. Steinberg

11:15–11:30 am
EC-IC Bypass for Extracranial or Intracranial Vaso-occlusive Disease
Sepideh Amin-Hanjani

11:30–12:15 pm
Didactic Session 4: Management of Extracranial Atherosclerotic and Vaso-occlusive Disease: An Update

11:30–11:45 am
CAS for Extracranial Atherosclerotic Disease
Stavropoula I. Tjoumakaris

11:45 am–12:00 pm
CEA for Extracranial Atherosclerotic Disease
Christopher S. Ogilvy

12:00–12:15 pm
An Update on CREST-2
Bernard R. Bendok

12:15–1:15 pm
Lunch Breakout Session with Corporate Sponsor

1:15–2:15 pm
Didactic Session 5: Optimal Treatment of Intracranial Aneurysms: An Update

1:15–1:30 pm
Management of Unruptured Aneurysms: Natural History and Indications
Michael F. Stiefel

1:30–1:45 pm
Primary or Adjunctive Coiling of Intracranial Aneurysms in the Era of Expanding Technology
Brian Lim Hoh

1:45–2:00 pm
Bypass for Intracranial Aneurysms in the Era of Flow Diversion
Jacques J. Morcos

2:00–2:15 pm
Management of Vasospasm: A Critical Update
R. Loch Macdonald

2:15–3:00 pm
Didactic Session 6: New Technologies for Interventional Treatment of Intracranial Aneurysms: An Update

2:15–2:30 pm
Flow Diversion
Peter Kan

2:30–2:45 pm
Endosaccular Devices
Alexander Lewis Coon

2:45–3:00 pm
Novel Stents and Coils
Ricardo A. Hanel

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

3:30–4:30 pm
Didactic Session 7: Management of Arteriovenous Malformations and Dural Arteriovenous Fistula: An Update

3:30–3:45 pm
Surgical Treatment
Michael T. Lawton

3:45–4:00 pm
Endovascular Treatment
Babu Guai Welch

4:00–4:15 pm
Radiosurgical Treatment
Bruce E. Pollock

4:15–4:30 pm
Current Management of Dural Arteriovenous Fistula
Ali Alaraj

4:30–4:45 pm
Didactic Session 8: Management of ICH: An Update

4:30–4:45 pm
Surgery for ICH: Latest Evidence and Device
J D. Mocco

4:45–5:00 pm
Questions and Discussion

Educational Grant provided by Codman Neuro.

SATURDAY, SEPTEMBER 24 • 8:00 AM–4:00 PM

PRACTICAL COURSES

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 am–4:00 pm

Part 1: Didactic and Lab $1,600
Parts 1 & 2: Didactic and Lab $3,000
Please note: you will automatically be registered for PC15

Part 1: Didactic Only $550
Parts 1 & 2: Didactic Only $1,000
Please note: you will automatically be registered for PC15

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

COURSE DIRECTORS: James J. Evans, Daniel M. Prevedello

FACULTY: Manish Kumar Aghi, William T. Couldwell, Juan Carlos Fernandez-Miranda, John A. Jane Jr., Daniel F. Kelly, James K. Liu, 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.
- Review methods for complication avoidance during endonasal surgery.
- Compare and contrast the merits of open and endoscopic approaches to similar cranial base targets.
- Build competence in the surgical techniques required for these procedures through cadaveric lab.

CV 8:00–11:30 am Fee: $450

NEW!

PC02 Cerebrospinal Fluid Abnormalities Update (Chiari, Pseudotumor, Hydrocephalus): Case-based Learning

COURSE DIRECTORS: Jeffrey R. Leonard, David D. Limbrick

FACULTY: Richard C. E. Anderson, Kenneth C. Liu, Mark G. Luciano, John M. McGregor, Guy M. McKhann, Benjamin C. Warf

COURSE DESCRIPTION: This course will focus on the pitfalls and unique problems in patients with cerebrospinal fluid abnormalities. Faculty will illustrate principles using case-based examples. Enrollees are encouraged to bring their own cases for discussion.

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

- Avoid complications in complicated hydrocephalus patients.
- Discuss the indications for treatment in Chiari patients with craniocervical abnormalities.
- Identify and discuss treatment options for pseudotumor patients.
- Identify pseudotumor patients who may benefit from endovascular treatment.
- Develop patient selection tools for patients who may benefit from CSF diversion, and apply these tools to their clinical practice.

SE 8:00–11:30 am Fee: $450

PC03 Leadership Development for the Practicing Neurosurgeon

COURSE DIRECTORS: Elad I. Levy, David J. Langer, Stacey Q. Wolfe

FACULTY: Fady T. Charbel, Isabelle M. Germano, Raj K. Narayan, Robert John Weil

COURSE DESCRIPTION: In the rapidly changing healthcare environment, just like successful business, successful practices maintain a competitive advantage by having strong leadership, a clear vision, and persistent innovation. In this practical course, the keys to effective leadership will be critically assessed. Topics covered will include managing people, managing change, creating vision, managing risk, managing conflict.

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

- Describe and implement advanced skills and techniques in managing people.
- Examine and discuss advanced skills and techniques in managing organizational change.
- Describe and implement advanced skills and techniques in creating strategic vision.
- Describe and implement advanced skills and techniques in managing institutional risk.
- Describe and implement advanced skills and techniques in managing conflict.

TU 8:00–11:30 am Fee: $450

PC04 Surgical Management of Eloquent Area Tumors: Functional Mapping and/or Navigation

COURSE DIRECTORS: Mitchel S. Berger, Shawn L. Hervey-Jumper

FACULTY: Lorenzo Bello, Richard W. Byrne, Hugues Duffau, George Samandouras

COURSE DESCRIPTION: This is a course that will outline in detail the management strategies for removing tumors in eloquent or functional areas utilizing the technique of functional brain mapping.

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

- Review 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 expedite extent of resection and outcome for brain tumors in functional regions.
- Identify the tools and operating room required to safely perform these procedures in their practice.

SP 8:00–11:30 am Fee: $450

NEW!

PC05 Minimally Invasive Spine Surgery: What You Know and Where We Need to Go

COURSE DIRECTORS: Adam S. Kanter, Praveen V. Mummaneni

FACULTY: Richard G. Fessler, Kevin T. Foley, Langston T. Holly, Paul Park, Wilson Zachary Ray, Khoi Duc Than, Juan S. Uribe

COURSE DESCRIPTION: This course will explore the expanding role of MIS spine surgery, including surgical indications for degenerative disease, spinal deformity, and tumors. The course will cover techniques, complications, and management strategies with interactive case lectures that encourage audience participation. Topics such as length of stay, reoperations, readmissions, and quality parameters related to MIS spine surgery will be discussed.

LEARNING OBJECTIVES: *Upon completion of*

this course, participants will be able to:

- Discuss the expanding indications for MIS spine surgery as well as the contraindications.
- Explore the causes of complications and management.
- Learn the impact of MIS surgery on quality parameters and length of stay and reops/readmissions.
- Consider introduction or expansion of MIS techniques in their own practice.

TU 12:30–4:00 pm Fee: $450

NEW!

PC06 Complex Skull Base and Brain Tumor Surgery: 3D Surgical Anatomy and Technical Nuances

COURSE DIRECTOR: Juan Carlos Fernandez-Miranda

FACULTY: Mustafa Kemal Baskaya, Aaron Cohen-Gadol, William T. Couldwell, Jacques J. Morcos, Ugur Ture

COURSE DESCRIPTION: This special 3D course will review relevant surgical anatomy and technical nuances for improving patient outcomes during complex skull base and brain tumor procedures. After a focused 3D surgical anatomy review, illustrative clinical cases will be presented by experience surgeons using 3D high-definition surgical videos to maximize the learning experience for the participants. Targeted audience includes senior-level trainees, general neurosurgeons with an interest in cranial surgery, and subspecialized neurosurgeons.

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

- Outline general techniques and surgical approaches for complex skull base and brain tumors.
- Identify key anatomical landmarks for the performance of transcranial and endonasal skull base approaches to the anterior, middle, and posterior skull base.
- Describe major white mater pathways and surgical techniques required for resection of complex intrinsic brain tumors.
- Implement these transcortical and skull base approaches in their own practice with the benefit of 3D interactive walkthrough of surgical landmarks.

SP 12:30–4:00 pm Fee: $450

PC07 Peripheral Nerve Surgical Exposures and Techniques

COURSE DIRECTORS: Rajiv Midha, Robert J. Spinner

FACULTY: Holly Gilmer, Amgad S. Hanna, Line Jacques, Mark Alexander Mahan, Elias Rizk, 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:*

- Demonstrate common surgical exposures to nerves throughout the body.
- Discuss the management of common peripheral nerve disorders, including entrapments, tumor, trauma, and pain.
- Cite examples of commonly performed new techniques (e.g., nerve transfers) and their indications.
- Develop familiarity and increased competence in these procedures through cadaveric practice.

TU 12:30–4:00 pm Fee: $450

NEW!

PC08 Brain Metastases: Case-based Approach to Surgery, Radiosurgery, and Laser Ablation

COURSE DIRECTOR: J. Bradley Elder, Steven Kalkanis

FACULTY: Gene Barnett, Lawrence Chin, Matthew Ewend, Jeffrey J. Olson, Michael Weaver

COURSE DESCRIPTION: This practical course offers critical analysis of current and emerging treatment strategies for patients with brain metastases. Interventions including surgical resection, radiosurgery, and laser interstitial thermal therapy (LITT) are discussed using case presentations as examples. Emphasis will be placed on understanding current guidelines and published evidence for each treatment strategy alone and in combination. Rationale for emerging treatment strategies will also be evaluated. Participants should expect to finish the course with a current understanding of standard and emerging treatment strategies available for neurosurgeons for the treatment of patients with brain metastases.

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

- Explain current guidelines related to surgical treatment of brain metastases.
- Summarize radiation techniques and indications for patients with brain metastases.
- Describe laser interstitial thermal therapy and evaluate evidence for and against its role in treating patients with brain metastases.
- Discuss the importance of a multimodality approach to brain metastasis treatment.
- Apply these patient selection and research principles in their own brain tumor practice.

SE 12:30–4:00 pm Fee: $450

PC09 CPT Coding and All You Need for ICD-10

COURSE DIRECTOR: Henry H. Woo

FACULTY: Joseph S. Cheng, Darlene Angela Lobel, John K. Ratliff, Clemens M. Schirmer

COURSE DESCRIPTION: This course will include brief primers on CPT coding for various neurosurgical procedures and an update on any new CPT codes recently passed by the AMA. The course will also provide an overview of ICD-10 and some data on how the implementation has affected neurosurgical practices.

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.
- Review the new ICD-10 classification.
- Implement these coding changes in their own practices to insure accuracy and reimbursement.

SP 12:30–4:00 pm Fee: $450

PC10 Cervical Degenerative Case Management

COURSE DIRECTOR: Michael G. Kaiser

FACULTY: Kurt M. Eichholz, Francis Farhadi, Daniel J. Hoh, Langston T. Holly, John E. O'Toole, Srinivas K. Prasad, Charles A. Sansur, Jason E. Tullis

COURSE DESCRIPTION: The indications, techniques, and complication management involving surgical intervention for degenerative disease of the cervical spine will be reviewed with an emphasis on case presentations. Cases presented by the faculty will be supplemented by brief didactic presentations incorporating medical evidence for current, well-designed clinical studies. Audience participation will be encouraged through open discussions during case presentations and sawbone demonstrations. Upon completion of this course, participants will be able to discuss the appropriate indications, state-of-the-art surgical techniques, as well as effective strategies to avoid and address operative complications.

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

- Identify appropriate surgical indications for management of cervical degenerative spine disease.
- Provide reasonable surgical alternatives for the various degenerative pathologies.
- Identify appropriate strategies to avoid and address surgical complications.
- Counsel patients on surgical management and risks of cervical degenerative disease.

SP 12:30–4:00 pm Fee: $450

PC11 My Worst Spine Complication: Case-based Examples and What I Learned

COURSE DIRECTORS: Juan S. Uribe

FACULTY: Joseph S. Cheng, Robert F. Heary, R. John Hurlbert, J. Patrick Johnson, Laurence D. Rhines, Michael P. Steinmetz

COURSE DESCRIPTION: Faculty will bring and present their own cases (complications) systematically from diagnosis to surgical procedure followed by postoperative short and long clinical follow up. Complications will be disclosed, followed by learning facts that include complication avoidance and management. Each faculty member will also serve as panelist during case discussions. The course is designed to have active interaction with participants.

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

- Identify potential factors that contribute to surgical complications.
- Review how to avoid complications by recognizing standard surgical techniques and best surgical practices.
- Discuss the value of effective preoperative and intraoperative planning.
- Manage complications related to specific surgical procedures.
- Apply these lessons in their own surgical management of spinal disease.

TR 12:30–4:00 pm Fee: $450

PC12 Neurocritical Care and Neurosurgical Emergencies Update

COURSE DIRECTORS: Jack Jallo, Christopher J. Madden

FACULTY: Kamran Athar, Randall Matthew Chesnut, Catriona Harrop, Ryan Kitagawa, Ian E. McCutcheon, Kim L. Rickert, Lynda Yang

COURSE DESCRIPTION: Course is designed to review a variety neurosurgical emergencies using a case-based model. Cases reviewed include cranial and peripheral nerve injury.

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

- Review the diagnosis and management of cerebral trauma, spinal trauma, and peripheral nerve injury.
- Identify the correction of coagulopathy for the neurosurgeon.
- Discuss the management of malignant stroke and status epilepticus.
- Identify neurosurgical emergencies within their own practice and apply urgent, time senstive therapies.

5:00–6:30 pm
INTERNATIONAL RECEPTION

CNS 2016 ANNUAL MEETING

Dinner Seminar 01

Complimentary shuttle service will be provided for all dinner seminars. Shuttles will depart from the Marriott Marquis San Diego Marina Hotel.

Saturday, September 24 • 6:00–8:30 pm • Fee: $190

SP **DIN01**

Cervical Spondylotic Myelopathy

MODERATORS: Michael G. Fehlings, Robert F. Heary

SPEAKERS: Paul M. Arnold, Andrew T. Dailey, Langston T. Holly

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

- Discuss etiology and natural history of cervical spondylosis.
- Define cervical myelopathy.
- Review advantages of various surgical approaches to treat CSM.

Eddie V's

Consistently named as one of the best restaurants in the Marina District, Eddie V's offers elegant, fine-dining with a charismatic vibe. Seafood and steaks are a specialty. Fish arrive daily from pristine waters around the world and USDA Prime steaks are specially aged to ensure peak flavor. Enjoy world-class wine and service, beautiful artwork, and enticing live jazz in the V lounge.

Neurosurgical Residents!

The 2016 CNS Annual Meeting has more of everything you want

Free or Discounted Registration to the Annual Meeting
The first 80 CNS Resident members receive complimentary registration* for the CNS Annual Meeting, and all residents enjoy discounted registration, with access to General Scientific Sessions, Original Science Program, Live Surgery Sessions, Exhibit Hall, and more. **Registration fee reimbursed after residents attend the CNS Annual Meeting. Educational grant provided by DePuy Synthes.*

Complimentary Resident Housing
Free hotel accommodations in San Diego available on a first come, first-serve basis for CNS Resident members. Application deadline July 1.

Sergeant-at-Arms Program
Volunteer as a Sergeant-at-Arms and receive complimentary admission to a practical course or luncheon seminar.

Resident Educational Courses
Take advantage of specialized learning opportunities.

Discounted tickets to Luncheon Seminars
Three days of neurosurgical courses served up with a plated lunch.

Invitation to Honored Guest Luncheon
Complimentary lunch and a talk from 2016 Honored Guest Dr. Edward H. Oldfield.

Resident Recruitment Social
A relaxed and informal networking event with recruiters and prospective employers.

SANS Challenge
Annual residency program battle for SANS dominance.

Visit cns.org/2016
to join the CNS Annual Meeting

PROGRAM HIGHLIGHTS

8:00 AM–4:00 PM
SYM02: SPINAL CORD STIMULATION:
The Transformation

6:10–6:30 PM
JOHN THOMPSON HISTORY OF MEDICINE LECTURE
Daniel James Brown

4:51–5:11 PM
FEATURED SPEAKER
Vice Admiral Mike Shoemaker

6:30–8:30 PM
OPENING RECEPTION
Marriott Marquis San Diego Marina

5:47–6:07 PM
MICHAEL L.J. APUZZO LECTURER ON CREATIVITY AND INNOVATION
2016: The Constition at a Crossroads
Akhil Reed Amar

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

Sunday, September 25 | 8:00 am–4:00 pm

The ANSPA Annual CME Meeting, presented for the first time in collaboration with the CNS, is created specifically for PAs and NPs working in, or interested in, neurosurgery.

See Page 24 for course details.

CNS

Association of Neurosurgical Physician Assistants
ANSPA

SYMPOSIUM 02

PA SP 8:00 am–4:00 pm **Fee: $300**

NEW!

SYM02: Spinal Cord Stimulation: The Transformation

COURSE DIRECTORS: Nandan Lad, Jennifer Sweet, Ashwini D. Sharan

FACULTY: Jeff Arle, John Chae, Milind Deogaonkar, Steven Falowski, Andre Machado, Jonathan Miller, Richard North, Erika Petersen, Ali Rezai, Joshua Rosenow, Jason Schwalb, Konstantin Slavin

COURSE DESCRIPTION: New data and technologies are rapidly changing the field of Spinal Cord Stimulation. Historically, this technology has been utilized for management of spinal pain for over three decades. Today, there are new technology releases occuring every year. These have included changes in the understanding on paradigms in the frequency of stimulation, target structures such as the dorsal root ganglion, and the emergence of new tools. This symposium includes a collection of experts to update the attendee on all these revolving changes.

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

- Identify the prospective RCT data on the use of 10kHz stimulation on the spinal cord.
- Identify the prospective data on the use of dorsal root ganglion stimulation.
- Distinguish neurostimulation technologies and their interaction with MRI.
- Discuss the nuances in equipment and technology evolving in Spinal Cord Stimulation Technologies.
- Develop strategies for the introduction of new stimulation technologies into their practice.
- Recognize patients in their practice who may benefit from these advancements.

8:00–9:10 am
Didactic Session 1—Data Driven

8:00–8:15 am
High Frequency Stimulation: RCT and Two-year Follow-up Data
Ashwini D. Sharan

8:15–8:30 am
Dorsal Root Ganglion Stimulation for CRPS
Jennifer Sweet

8:30–8:45 am
MRI Compatibility and Its Significance
Nandan Lad

8:45–9:00 am
Socio-economics of SCS
Nandan Lad

9:00–9:10 am
Discussion

9:10–9:50 am
Morning Breakout Session with Corporate Sponsor

9:50–10:20 am
Didactic Session 2—Equipoise

9:50–10:00 am
Emerging Science on Neuronal Stimulation Parameters: High Frequency vs. Tonic Stimulation Science
Jonathan Miller

10:00–10:10 am
Burst Stimulation for Pain
Konstantin Slavin

10:10–10:20 am
Panel Discussion

10:20–11:00 am
Morning Breakout Session with Corporate Sponsor

11:00–11:35 am
Didactic Session 2—Equipoise, continued

11:00–11:10 am
SCS and Low Back Pain: Why and How Would Waveform Matter
Jeff Arle

11:10–11:25 am
Muscle Stimulation for Pain
John Chae

11:25–11:35 am
Clinical Panel Discussion—How Will This Fit into Your Practice?
Erika Petersen, Andre Machado

11:35 am–12:30 pm
Lunch

12:30– 1:00 pm
Didactic Session 3—Nuts & Bolts

12:30–12:40 pm
The Differences Between Paddles
Erika Petersen

12:40–12:50 pm
The Differences Between IPGs
Erika Petersen

12:50–1:00 pm
Discussion

1:00–1:40 pm
Afternoon Breakout Session with Corporate Sponsor

1:40–2:20 pm
Didactic Session 3—Nuts & Bolts, continued

1:40–1:52 pm
Surgical Techniques for Complication Avoidance—Percutaneous
Joshua Rosenow

1:52–2:04 pm
Surgical Techniques: Awake vs. Asleep Placement
Steven Falowski

2:04–2:16 pm
Revision SCS: When and How to Do What?
Jason Schwalb

2:16–2:20 pm
Discussion

2:20–3:00 pm
Afternoon Breakout Session with Corporate Sponsor

3:00–4:00 pm
Didactic Session 4—Emerging Therapies

3:00–3:15 pm
Emergence of Autonomic Stimulation
Ali Rezai

3:15–3:30 pm
Emergence of Stimulation for Headaches
Milind Deogaonkar

3:30–3:45 pm
Minimally Invasive Peripheral Nerve Stimulation
John Chae

3:45–4:00 pm
Wireless Stimulation
Richard North

SUNDAY, SEPTEMBER 25 • 8:00 AM–4:00 PM

PRACTICAL COURSES

GE 8:00 am–4:00 pm Complimentary

NEW!

PC13 ANSPA Annual Fall CME Meeting: Presented in Collaboration with the CNS

COURSE DIRECTORS: Joshua Beardsley, Michael F. Nido

FACULTY: Kevin S. Cahill, H. Gordon Deen

COURSE DESCRIPTION: The ANSPA Annual CME Meeting, presented for the first time 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 common diagnoses related to neurosurgical pathology across multiple specialties.
- 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.

RE 8:00 am–4:00 pm Fee: $250

NEW!

PC14 ABNS Primary Examination High Yield Review

COURSE DIRECTORS: Chaim B. Colen, Daniel Refai

FACULTY: Cargill H. Alleyne, Victor Chang, Chaim Colen, Carl Heilman, Jack Jallo, Gustavo Pradilla, Zay Ray, Daniel Refai, Clemens Schirmer

COURSE DESCRIPTION: This course is designed for neurosurgery residents who are in training and preparing for the ABNS written examination. An overview of the ABNS goals and evaluation process will be discussed. In addition, study techniques as well as example questions and answers will be provided.

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

- Review the outline of ABNS written boards.
- Review study strategies and areas to concentrate to enhance performance.
- Discuss breakdown and review question format for neurosurgery evaluation.
- Review neurosurgical anatomy, pathophysiology, neurology, neuroradiology, and neurocritical care.
- Identify the principles emphasized in the ABNS certification process.

TU 8:00 am–4:00 pm

Part 2: Didactic and Lab $1,600

Part 2: Didactic Only $550

PC15 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, Sebastien Froelich, Jacques J. Morcos, Theodore H. Schwartz, Chandra N. Sen

COURSE DESCRIPTION: This course is designed to allow (both novice and experienced) surgeons to enhance their knowledge and hand-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.
- Review methods for 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.

SE 8:00–11:30 am Fee: $450

NEW!

PC16 eNeurosurgery: Adapting Your Practice for 2016 and Beyond

COURSE DIRECTORS: Brian V. Nahed, Ann R. Stroink

FACULTY: Anthony L. Asher, Maya A. Babu, Deborah L. Benzil, Dean G. Karahalios, Jeremy Todd Phelps, John K. Ratliff, Clarence B. Watridge

COURSE DESCRIPTION: Whether an employed, academic, or private practice neurosurgeon, the challenges in improving and maintaining an efficient, engaging, and satisfying office setting can be daunting. This course will discuss the changing landscape of neurosurgery practice in response to metrics, meaningful use, physician extenders, patient satisfaction, and a neurosurgeon's online reputation while assisting the neurosurgeon in preparing for 2016 and beyond.

LEARNING OBJECTIVES: *After completion of this course, participants should be able to:*

- Identify one's online reputation through private and federal websites and databases, and how to build an online presence.
- Identify and apply metrics used to rate neurosurgeons and effective measures to minimize the effort to surpass these metrics.
- Outline alternative practices (group vs hospital practices, and concierge practices).
- Identify and maximize the new role of physician extenders in the evolving healthcare environment.
- Discuss individual physician, hospital, institutional, and insurance company efforts that have been successful in reducing medical malpractice.
- Apply these strategies in improving practice development and visibility.

TU 8:00–11:30 am Fee: $450

NEW!

PC17 Cased-based Approach for Surgery/SRS for Malignant Tumors

COURSE DIRECTORS: Manish K. Aghi, Andrew E. Sloan

FACULTY: Steven D. Chang, Costas G. Hadjipanayis, Jeffrey J. Olson, Sujit S. Prabhu, Jason P. Sheehan, Jeffrey S. Weinberg, Isaac Yang

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 treatments 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 simulation.

TU 8:00–11:30 am Fee: $450

PC18 Surgical Neuroanatomy I (Supratentorial)

COURSE DIRECTOR: Michael T. Lawton

FACULTY: Arthur L. Day, Juan Carlos Fernandez-Miranda, Michael William McDermott, Nader Sanai

COURSE DESCRIPTION: The course will present surgical neuroanatomy as it relates to common neurosurgical procedures covering the supratentorial space. The course will review anatomy encountered in the surgical approaches and surgical techniques used to treat vascular pathologies and skull base tumors. The content will be anatomy and clinical cases from expert neurosurgeons that demonstrate the application of anatomical knowledge needed to perform these operations skillfully.

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

- Discuss the surgical anatomy of the pterional and orbitozygomatic exposures.
- Review the surgical anatomy of the far lateral exposure.
- Identify the surgical anatomy of the transpetrous exposures.
- Describe the surgical anatomy of the ventricles, interhemispheric fissure, and pineal region.
- Apply these surgical approaches in their own practice.

CV 8:00–11:30 am Fee: $450

NEW!

PC19 Advanced Cerebrovascular Surgery: 2D and 3D Operative Video-based Surgical and Anatomical Pearls

COURSE DIRECTOR: Peter Nakaji

FACULTY: Nicholas C. Bambakidis, Daniel L. Barrow, H. Hunt Batjer, Arthur L. Day, Michael T. Lawton, Robert F. Spetzler

COURSE DESCRIPTION: This course will employ a dynamic senior faculty and use 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:*

- Approach basic and complicated aneurysms in a systematic way to achieve 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.

SP 8:00–11:30 am Fee: $450

PC20 Spinal Deformity: Case-based Update

COURSE DIRECTOR: Christopher I. Shaffrey

FACULTY: Ian G. Dorward, Daniel Robert Fassett, Jeremy L. Fogelson, Praveen V. Mummaneni, Juan S. Uribe

COURSE DESCRIPTION: A series of cases ranging from simpler degenerative spine, with a component of deformity, to progressively greater levels of spinal deformity will be presented. Emphasis on the appropriate evaluation of spinal deformity and the entire spectrum of treatment options will be discussed. Nonsurgical management and indications for simple decompression or limited fusion, and cases requiring more complex reconstructive surgery will also be presented. Experts in minimally invasive approaches, anterior, lateral, and posterior approaches and osteotomy procedures will debate the merits of the different approaches available. Interaction between faculty and participants will be strongly encouraged, and there will be opportunities for participants to present their own cases.

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

- Identify radiographic parameters associated with spinal deformity.
- Discuss the spectrum of treatment options available to patients with spinal deformity.
- Determine the factors that determine when an anterior, lateral or posterior approach may give the best outcomes in the surgical management of spinal deformity.
- Describe when limited and minimally invasive approaches may be most effective and an option for reducing complications.
- Recognize common complications associated with treatment of spinal deformity and strategies for reducing complications.

Educational grant provided by DePuy Synthes Spine

SP 8:00–11:30 am Fee: $450

NEW!

PC21 Thoracolumbar: Trauma, Tumor, and Degenerative: Case-based Presentations

COURSE DIRECTOR: Michael Y. Wang

FACULTY: Ali A. Baaj, Daniel Robert Fassett, Adam S. Kanter, Christopher Michael Maulucci, Laurence D. Rhines

COURSE DESCRIPTION: This half-day didactic practical course will be conducted in an engaging, case-based format to enhance audience participation. Controversial aspects of both common and complex spinal conditions will be discussed utilizing specific cases. In this way potential pitfalls in diagnosis, medical management, and surgical technique will be highlighted. Attendees are also encouraged to bring their own cases for discussion.

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

- Describe complications and their management in spinal trauma.
- Discuss various surgical approaches to spinal column tumors.
- Outline optimal management strategies for adult degenerative deformity.
- Apply these patient selection criteria and operative strategies to their practice.

TR 8:00–11:30 am Fee: $450

PC22 Trauma Update: Traumatic Brain Injury–Case-based Learning

COURSE DIRECTOR: Shelly D. Timmons

FACULTY: Rocco Armonda, Gregory J. Murad, David O. Okonkwo, Roland A. Torres, Jamie S. Ullman

COURSE DESCRIPTION: The modern management of traumatic brain injury (TBI) is ever-changing and complex. Clinical trials in TBI are complicated, and the results often lead to new controversies in the neurosurgical treatment of TBI. New technologies in neuroimaging and neuromonitoring are improving the neurosurgeon's ability to take care of TBI patients. Understanding evolving guidelines on TBI is important to every neurosurgeon. This course will cover current clinical trials, new technologies, and the most up-to-date guidelines. This course will be of interest not only to the neurosurgeon who takes care of TBI on a daily basis, but also to the general neurosurgeon interested in updating his or her knowledge base.

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

- Describe current clinical trials

in traumatic brain injury.
- Discuss new technologies and monitoring for traumatic brain injury
- Analyze the most up-to-date guidelines on traumatic brain injury.
- Apply these new data to their own management of patients with traumatic brain injury.

SE 8:00–11:30 am Fee: $450

NEW!

PC23 Neurosurgeon-Hospital Relationships: Options, Negotiations, and Achieving What You Are Worth

COURSE DIRECTOR: Dong H. Kim

FACULTY: Deborah L. Benzil, Robert E. Harbaugh, Stephen Papadopoulos, Alan M. Scarrow, Mitesh 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 healthcare, 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.

TU 12:30–4:00 pm Fee: $450

NEW!

PC24 Pituitary Surgery: Indications, Techniques, and Outcomes

COURSE DIRECTORS: John A. Jane Jr., Edward R. Laws

FACULTY: Ian F. Dunn, Juan Carlos Fernandez-Miranda, Daniel F. Kelly, Andrew S. Little, Edward H. Oldfield, Oluch Olunya, Nelson M. Oyesiku, Theodore H. Schwartz, Jason P. Sheehan, Gabriel Zada

COURSE DESCRIPTION: The 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 also be discussed. Complication avoidance, skull base repair, and indications for radiosurgery will also be emphasized. Lastly, faculty will also 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.
- Apply these principles in their own patient selection and surgical management of patients requiring pituitary surgery.

SP 12:30–4:00 pm Fee: $450

PC25 Spinal Biomechanics in Clinical Practice

COURSE DIRECTOR: Tyler R. Koski

FACULTY: Nader S. Dahdaleh, Andrew T. Dailey, John C. Liu, John H. Shin, Zachary Adam Smith, Gregory R. Trost, Stephanus Viljoen

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

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Integrate biomedical principles and strategies of spinal surgery into their surgical planning.
- Strategize to avoid and manage complications.
- Apply biomechanical principles in counseling patients with spinal disease.

SE 12:30–4:00 pm Fee: $450

NEW!

PC26 Improve Quality, Reduce Cost, and Increase Revenue

COURSE DIRECTOR: Zoher Ghogawala

FACULTY: Anthony L. Asher, Bob S. Carter, Fady T. Charbel, Michael P. Steinmetz, J. Sanford Schwartz, Robert G. Whitmore

COURSE DESCRIPTION: This course will use a case-based approach to demonstrate what quality looks like from a neurosurgical perspective. It is important that we recognize the importance of traditional quality metrics (SSIs, re-admissions, etc.) but also identify neurosurgical quality measures that document what excellent care represents. We will include health economic impact of quality assessment and will also include unique revenue opportunities based upon documentation of high neurosurgical quality.

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Define Quality Care from Neurosurgical Perspective and differentiate it from traditional quality metrics.
- Define how surgical site infection and unplanned hospital admissions increase health costs.
- Discuss how improving quality lowers cost.
- Learn about novel strategies for increasing revenue using quality data.
- Apply these data collection methods and quality outcomes assessment in their own practice.

SF 12:30–4:00 pm Fee: $450

PC27 Laser Ablation Surgery: Opportunities, Indications, Technique, and Outcome

COURSE DIRECTOR: Daniel Curry, Shabbar F. Danish

FACULTY: Jonathan R. Jagid, Adrian Walter Laxton, Eric C. Leuthardt, Claudio Esteves Tatsui

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 that 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.

TU 12:30–4:00 pm Fee: $450

PC28 Surgical Neuroanatomy II (Infratentorial)

COURSE DIRECTOR: Michael T. Lawton

FACULTY: Mustafa Kemal Baskaya, Paul A. Gardner, John G. Golfinos, Jacques J. Morcos, Philip V. Theodosopoulos

COURSE DESCRIPTION: The course will present surgical neuroanatomy as it relates to common neurosurgical procedures, covering the infratentorial space. The course will review anatomy encountered in the surgical approaches and surgical techniques used to treat vascular pathologies and skull base tumors. The content will be anatomy and clinical cases from expert neurosurgeons that demonstrate the application of anatomical knowledge needed to perform these operations skillfully.

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

- Discuss the surgical anatomy of the pterional and orbitozygomatic exposures.
- Review the surgical anatomy of the far lateral exposure.
- Identify the surgical anatomy of the transpetrous exposures.
- Describe the surgical anatomy of the ventricles, interhemispheric fissure, and pineal region.
- Apply these approach techniques in their management of patients with cranial disease.

SE 12:30–4:00 pm Fee: $450

NEW!

PC29 Planning for Your Future—From 35 to 100: Strategic Planning, Economics, Marriage, Family, Illness, and More. Should You Retire?

COURSE DIRECTOR: James I. Ausman

FACULTY: Carolyn R. Ausman, Margaret R. Chambers, Shahin Etebar, James B. Mansfield, Karen Mansfield

COURSE DESCRIPTION: This course is designed to provide attendees, from the time they finish residency till they are 100, with advice on what to do with the challenges of extended life, probable loss of Social Security, what to do in these challenging economic times, and in general developing a strategic plan for your future, which should be re-evaluated every five years and yearly with goals and strategies to accomplish those goals. Illness or accidents cannot be anticipated but must be faced and accommodated. Audience participation will be encouraged. Interesting speakers will be invited to provide their input. This will be an open exchange forum so that you can learn from others what they are thinking and doing. What you will learn is there is no one plan for everyone but that planning should start early, right out of residency. Learn from the wisdom of your colleagues, younger and older.

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

- Discuss how to plan for and develop the multiple careers you will have in your future.
- Identify the steps needed to develop a strategic plan for your future.
- Evaluate if retirement is a healthy physiologic choice and what life will be like in the future.
- Review the present and upcoming economic crisis and its effect on medical and social advances.
- Identify your place in a dynamically changing life.

TU 12:30–4:00 pm Fee: $450

PC30 My Worst Cranial Complication: Case-based Examples and What I Learned

COURSE DIRECTORS: William T. Couldwell, Jack P. Rock

FACULTY: Aviva Abosch, Ossama Al-Mefty, Aaron S. Dumont, Matthew Allan Hunt, Anil Nanda

COURSE DESCRIPTION: This course will use case presentations, didactic lectures, and interaction with faculty to provide clinical scenarios that may result in complications. Appropriate management will be reviewed. Strategies designed to anticipate and avoid complication will be discussed.

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

- Identify common complications associated with a variety of cranial procedures.
- Plan strategies to avoid and manage common cranial complications.
- Apply these treatment strategies in the recognition and mangement of their own cranial complications.

SP TR 12:30–4:00 pm Fee: $450

NEW!

PC31 Spinal Trauma Cased-based Guidelines Update

COURSE DIRECTOR: Michael G. Fehlings

FACULTY: Bizhan Aarabi, Daniel J. Hoh, Allan D. Levi, Srinivas K. Prasad, Jefferson R. Wilson

COURSE DESCRIPTION: This course will be a case-based interactive discussion and include a review of traumatic spinal cord treatment and management.

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

- Discuss the updated treatment of spine trauma and spinal cord injury inthe cervical and thoracolumbar spine, and amongst the pediatric, adult, and geriatric population.
- Review the current literature and updated guidelines for treatment of these conditions.
- Apply these guidelines in their own management of spinal trauma patients.

TR 12:30–4:00 pm Fee: $450

NEW!

PC32 Sports-related Head and Spinal Cord Injury: Return to Play and Other Management Considerations

COURSE DIRECTOR: Richard G. Ellenbogen

FACULTY: Julian E. Bailes, Gerald A. Grant, Michael L. Levy

COURSE DESCRIPTION: This course will cover the most cutting-edge updates on how to limit contact during sports, extreme sports, and boxing. The long-term risks of chronic traumatic encephalopathy, latest evidence for return-to-play, and education and advocacy related to sports-related head injuries will be reviewed.

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

- Advise patients, families, and other physicians about the latest evidence for return-to-play.
- Identify the risks of extreme sports and boxing, and how this relates to chronic traumatic encephalopathy.
- Review current education and advocacy efforts related to sports-related head injuries.
- Apply these lessons in their counseling of patients involved in contact activities.

TU 12:30–4:00 pm Fee: $450

NEW!

PC33 Surgery/SRS for Benign Tumors

COURSE DIRECTOR: Randy L. Jensen, Jason P. Sheehan

FACULTY: Aaron Cohen-Gadol, Franco DeMonte, Paul A. Gardner, Douglas Kondziolka, Michael J. Link, Edwin Mogere, Lynda Jun-San Yang

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.

1:00–3:00 pm
CNS RESIDENT SANS CHALLENGE
Preliminary Round

ANNUAL MEETING SPECIAL BENEFITS FOR US ACTIVE DUTY MILITARY MEMBERS

The CNS has a long and distinctive heritage of supporting military neurosurgeons. To honor those who serve our country, the CNS is offering **complimentary registration and limited free housing** to US Active Duty Military members.

Free housing is limited to the first 10 Active Duty Military CNS members registered for the CNS Annual Meeting.

Here's how to take advantage of these benefits:

CNS Members
When registering for the CNS Annual Meeting, please select Active Duty Military member on the online registration form at cns.org/2016.

If you are one of the first 10 Active Duty Military registrants, you will be contacted by the CNS staff to confirm housing arrangements.

Non-members
Please contact **membership@cns.org** to join the CNS and confirm that you qualify for these benefits.

CNS membership is complimentary to Active Duty Military neurosurgeons.

To see more great member benefits the CNS offers its Active Duty Military members visit **cns.org/membership**.

SUNDAY, SEPTEMBER 25

GENERAL SCIENTIFIC SESSION I

4:05–6:30 pm

PRESIDING OFFICER: Alan M. Scarrow

MODERATORS: Gerald A. Grant, Shekar N. Kurpad

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

- Discuss adaptions, advances, and achievements in the treatment of cerebral arteriovenous malformations.
- Apply advances in other leadership areas to neurosurgical practice.
- Discuss adaptions, advances, and achievements in the treatment of spinal deformity.
- Recognize the role of brain mapping in intracranial tumor surgery.
- Apply recent research in arteriovenous malformations, intracranial tumors, and spinal deformity to their management of these patients.

4:05–4:06 pm
Introductions and Disclosures
Gerald A. Grant

4:06–4:08 pm
Fellowship Award Presentations
Ricardo J. Komotar

4:08–4:11 pm
Executive Committee / Annual Meeting Committee Acknowledgements
Russell R. Lonser

4:11–4:15 pm
Presentation of Distinguished Service Award to Recipient Mary Louise Sanderson
Nathan R. Selden

4:15–4:19 pm
Presentation of Founder's Laurel Award to Recipient H. Hunt Batjer
Nathan R. Selden

4:19–4:21 pm
Introduction of CAANS President Graham A. G. Fieggen
Shekar N. Kurpad

4:21–4:31 pm
CAANS President
Graham A. G. Fieggen

4:31–4:48 pm
AVM Treatment Advances, Adapting to ARUBA
Robert F. Spetzler

4:48–4:51 pm
Introduction of Admiral Shoemaker
Gregory D. Willard

4:51–5:11 pm
Special Lecture
Vice Admiral Mike Shoemaker

5:11–5:28 pm
Adapting Spinal Deformity Alignment Principles to Achieve Improved Outcomes for Many Degenerative Spine Conditions
Christopher I. Shaffrey

5:28–5:45 pm
GBM: Adapting with Precision and Achieving a Change in the Landscape of Treatment and Understanding of the Disease
Mitchel S. Berger

5:45–5:47 pm
Introduction of Michael L. J. Apuzzo Lecturer on Creativity and Innovation
Arun Amar

5:47–6:07 pm
Michael L. J. Apuzzo Lecture on Creativity and Innovation
Akhil Reed Amar

6:07–6:10 pm
Introduction of John Thompson History of Medicine Lecturer Daniel James Brown
Richard G. Ellenbogen

6:10–6:30 pm
John Thompson History of Medicine Lecture
Daniel James Brown

YOU'RE INVITED!

Opening Reception

Sunday, September 25
6:30–8:30 pm

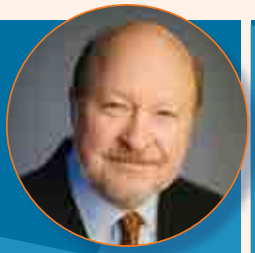
Gather with your friends and colleagues at the Marriott Marquis San Diego Marina hotel terrace for music, cocktails, and a delicious array of hors d'oeuvres. Kick off your Annual Meeting in west coast style with spectacular panoramic views of the San Diego Bay.

Daniel James Brown will be signing copies of his bestselling book, *The Boys in the Boat.*

M
9•26

MONDAY, SEPTEMBER 26

PROGRAM HIGHLIGHTS

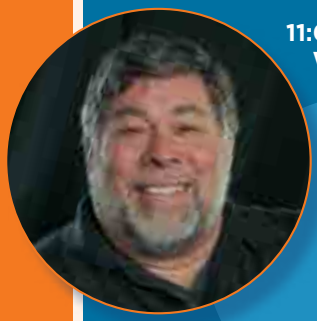


8:40–9:00 AM

HONORED GUEST PRESENTATION

Cushing's Disease: Lessons Learned from 1400 Cases

Edward H. Oldfield



11:00–11:30 AM

WALTER E. DANDY ORATION

iWoz: A Conversation with Steve Wozniak

Steve Wozniak

2:15–3:15 PM

CLINICAL CONTROVERSIES SESSION 1

L4/5 Lumbar Spondylolisthesis

2:15–3:15 PM

GUIDELINES SESSION 1

Guidelines for the Management of Traumatic Brain Injury

2:15–3:15 PM

OPERATIVE NEUROSURGERY 1

Live Neuroendovascular Surgery: Novel Devices and Treatment Controversies

MONDAY, SEPTEMBER 26

GENERAL SCIENTIFIC SESSION II

7:00–11:30 am

PRESIDING OFFICER: Steven N. Kalkanis

MODERATORS: James S. Harrop, J. Bradley Elder

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

- Discuss adaptions, advances, and achievements:
  - in the treatment of traumatic brain injury
  - in epilepsy surgery
  - in the treatment of medulloblastoma
  - in surgery for cerebral aneurysms
  - in the treatment of Cushing's Disease
  - in the health care system
- Apply these research and practice advancements to their neurosurgical care of these patient groups.

7:00–7:03 am
Introductions and Disclosures
James S. Harrop

7:03–7:21 am
Paving the Way for a New Era in Traumatic Brain Injury
Geoffrey T. Manley

7:21–7:39 am
Recent Advances in Epilepsy Surgery: Achieving Best Outcomes with HFOs, DTIs, MEGs, FCDs, and IONM
James T. Rutka

7:39–7:44 am
K12 Introduction and Summary
Emad N. Eskandar

7:44–7:56 am
K12 Awardee Talk Adapting the Field of Functional Neurosurgery to Achieve Bidirectional Control of Paralyzed Limbs
Timothy H. Lucas

7:56–8:01 am
Washington Committee Report
Shelly D. Timmons

8:01–8:17 am
Advances in Genomics Explain Medulloblastoma Behaviour at the Bedside
Michael D. Taylor

8:17–8:35 am
Advances in the Surgical Management of Paraclinoid Aneurysms: The 25th Anniversary of the Dallas Technique
H. Hunt Batjer

8:35–8:40 am
Introduction of Honored Guest Edward H. Oldfield
Russell R. Lonser

8:40–9:00 am
Honored Guest Presentation Cushing's Disease: Lessons Learned from 1400 Cases
Edward H. Oldfield

9:00–10:00 am
MORNING BEVERAGE BREAK
Visit the Exhibit Hall!

9:15–9:45 am
LIVE SURGERY
in the Exhibit Hall

10:00–10:16 am
Growing Brains: How Adapting to Africa Advanced the Treatment of Infant Hydrocephalus
Benjamin C. Warf

10:16–10:32 am
Achieving Optimal Outcome for Grade I Lumbar Spondylolisthesis: SLIP Study Results
Zoher Ghogawala

10:32–10:37 am
Introduction of CNS President Russell R. Lonser

10:37–10:57 am
CNS Presidential Address
Russell R. Lonser

10:57–11:00 am
Introduction of Walter E. Dandy Orator Steve Wozniak
Steven N. Kalkanis

11:00–11:30 am
Walter E. Dandy Oration iWoz: A Conversation with Steve Wozniak
Steve Wozniak

M 9•26

MONDAY, SEPTEMBER 26 • 11:45 AM–1:15 PM

LUNCHEON SEMINARS

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).

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

M01 Honored Guest Lunch

Complimentary to CNS Resident members!

SPEAKERS: Edward H. Oldfield

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

- Review his/her career path with other participants and summarize key decisions.
- Review successful connections and development between research and academic neurosurgery.
- Discuss Chiari malformation pathophysiology and syringomyelia development.
- Recognize the role of professional and personal mentorship in development as a neurosurgeon within their own practice environments.

TR

M02 Athletic Head Injuries: Return to Play

MODERATOR: H. Hunt Batjer

FACULTY: Julian E. Bailes, Michael D. du Trevou, Henry Feuer, James M. Johnston, Shelly D. Timmons

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

- Explain the potential short- and long-term consequences of athletic head injuries.
- Review and detail pathophysiology of concussions.
- Identify the signs and symptoms of concussion.
- Discuss issues related to return to play after athletic head injury.
- Apply these principles in their management of these conditions and counseling of patients.

SP

SANS supplemental exam is available for an additional $15.

M03 Guidelines for Lumbar Spine Degenerative Disease

MODERATOR: Daniel K. Resnick

FACULTY: Michelle J. Clarke, Daniel J. Hoh, Patrick C. Hsieh, John Pollina

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

- Assess current EBM literature on surgical treatment of degenerative lumbar spine disease.
- Analyze the indications and expected outcomes for various lumbar spine surgical procedures to improve their treatment plans.
- Identify key factors influencing the surgical decision for patients with degenerative lumbar spine disease.
- Apply these guidelines and patient selection principles in their management of patients with lumbar degenerative disease.

SP

NEW!

M04 Controversies in Spinal Deformity Surgery

MODERATOR: Christopher I. Shaffrey

FACULTY: Eli M. Baron, Yaser El-Bana, Tyler R. Koski, John C. Liu, Nicholas Theodore

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

- Review innovative treatment strategies for spinal deformity.
- Discuss current controversies in spinal deformity surgery.
- Explain current indications and guidelines for spinal deformity surgery.
- Apply these guidelines in their own surgical management or referral of patients with spinal deformity.

Educational grant provided by DePuy Synthes Spine

CV

M05 Intraoperative Vascular Complications—Prevention and Management

MODERATORS: Robert H. Rosenwasser, Carlos A. David

FACULTY: Anil Nanda, Alan S. Boulos, Fady T. Charbel, Andrew J. Ringer, Edgardo Spagnuolo, Gregory J. Zipfel

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

- Identify microsurgical options for preventing and managing intraoperative vascular complications.
- Describe scenarios which are high risk for intraoperative vascular complications.
- Discuss endovascular options for intraoperative vascular complications.

SP

M06 Peripheral Nerve Pain Syndromes: Diagnosis and Management

MODERATOR: Line Jacques

FACULTY: Shaun T. O'Leary, Konstantin V. Slavin, Gabriel C. Tender, Christopher J. Winfree

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

- Discuss clinical manifestations of peripheral nerve syndromes.
- List diagnostic approaches to peripheral nerve syndromes.
- Describe techniques to manage peripheral nerve syndromes.
- Apply these diagnostic tools in identifying patients in their own practice suffering from peripheral nerve pain syndromes and offer appropriate surgical management or referral.

TU

M07 Non-functioning Pituitary Adenomas: Operative Nuances and Management

MODERATOR: Theodore H. Schwartz

FACULTY: Manish Kumar Aghi, Elfatih Bashir, James P. Chandler, John A. Jane Jr., Nelson M. Oyesiku

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

- Outline the roles of medical, radiation, and surgical treatment for non-secretory pituitary adenomas.
- Describe the medical, imaging, and laboratory evaluation for various pituitary adenomas.
- Explain the surgical nuances of pituitary adenoma resection.
- Apply these patient selection and surgical techniques in their management of pituitary adenomas.

PE

SANS supplemental exam is available for an additional $15.

M08 Challenging Pediatric Neurosurgery Cases: Interactive Case-based Discussion

MODERATOR: Jeffrey Leonard

FACULTY: Graham A. G. Fieggen, Mark D. Krieger, Samuila Sannousi, Nathan R. Selden, Mark M. Souweidane

LEARNING OBJECTIVES: Upon completion of

this course, participants will be able to:
- Discuss the natural history and indications for treating pediatric neurosurgical diseases.
- Outline risk avoidance strategies in managing pediatric neurosurgical diseases.
- Describe the latest techniques and guidelines in managing pediatric neurosurgical pathologies.
- Apply these case lessons in their management or referral of pediatric patients that carry a neurosurgical diagnosis.

CV

NEW!

M09 Brain Arteriovenous Malformation: Multi-disciplinary Approach

MODERATOR: Jacques J. Morcos

FACULTY: Daniel L. Barrow, Kevin M. Cockroft, Rafael Rodriguez, Allan Taylor, Patrick P. Youssef

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Interpret natural history data pertaining to brain AVMs.
- Discuss the indications, risks, and benefits of radiosurgical, microsurgical, and endovascular approaches to brain AVMs.
- Outline multidisciplinary approaches to management strategies for brain arteriovenous malformations.
- Apply these patient selection principles to their own management of AVMs.

SP PA

NEW!

M10 Spinal Cord Stimulator for Back and Leg Pain: Show Me the Evidence

MODERATOR: Andre Machado

FACULTY: Jonathan Miller, Alon Y. Mogilner, Sean J. Nagel, Chengyuan Wu

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Outline the diagnostic workup and indications for a patient with back and/or leg pain who may benefit from spinal cord stimulator.
- Describe the surgical techniques for placement of a spinal cord stimulator.
- Summarize the outcomes for patients who receive a spinal cord stimulator.
- Apply these research findings to identify the susbset of patients in their own practice who may benefit from spinal cord stimulation.

TU

SANS supplemental exam is available for an additional $15.

M11 Acoustic Neuroma: Current Management Strategies

MODERATOR: Frederick George Barker

FACULTY: Steven L. Giannotta, Carl B. Heilman, Douglas Kondziolka, Michael J. Link

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.
- Summarize the epidemiology, natural history, and long-term prognosis after treatment for acoustic neuroma.
- Apply these data in counseling acoustic neuroma patients or offering treatment options within their own practice.

SP

NEW!

M12 Spinal Column Metastases Management

MODERATOR: Ziya L. Gokaslan

FACULTY: Mark H. Bilsky, Mostafa M.W. Kotb, Ilya Laufer, Daniel M. Sciubba, Claudio Esteves Tatsui

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Discuss differences in treatment strategies based on patient specific variables.
- Describe the importance of a multimodality, team-based approach to spinal column metastases.
- Summarize the indications for surgical management of spinal column metastases.
- Apply these data-driven, patient selection tools in their own management of spinal column metastases.

TU

NEW!

M13 Low-grade Glioma: Current Management Strategies

MODERATORS: Mitchel S. Berger, Nader Sanai

FACULTY: Hugues Duffau, J. Bradley Elder, Frederick F. Lang, Ying Mao, Sujit S. Prabhu

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Describe the multidisciplinary approach to treating low-grade gliomas.
- Discuss recent guidelines for managing low-grade glioma.
- Summarize the emerging therapies and clinical trials for low-grade glioma.
- Apply these guidelines in their own practice management of low grade gliomas.

SF

SANS supplemental exam is available for an additional $15.

NEW!

M14 Functional Neurosurgery: Emerging Opportunities

MODERATOR: Peter Konrad

FACULTY: Aviva Abosch, Kelly D. Foote, Casey H. Halpern, Nader Pouratian

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Identify emerging treatment strategies in functional neurosurgery.
- Describe different treatment techniques in functional neurosurgery.
- Summarize the importance of a multimodality approach to functional neurosurgery patients.
- Introduce recent technological advancements in functional neurosurgery into their practice.

SP

SANS supplemental exam is available for an additional $15.

NEW!

M15 Cervical Radiculopathy: Anterior Versus Posterior Cervical

MODERATOR: R. John Hurlbert

FACULTY: Sherif Ezzat, Ali Abou Madawi, Praveen V. Mummaneni, Russ P. Nockels, Christopher E. Wolfla

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Discuss the diagnostic workup of a patient with suspected radiculopathy.
- Identify treatment strategies for patients with cervical radiculopathy.
- Compare anterior versus posterior cervical surgical techniques.
- Describe the benefits and long-term prognosis for each approach.
- Apply these patient selection techniques in their surgical management of patients with cervical radiculopathy.

MONDAY, SEPTEMBER 26 • 1:15–3:15 PM

AFTERNOON SESSIONS

1:15–2:15 pm ***Visit the Exhibit Hall!***

AFTERNOON BEVERAGE BREAK

SP 2:15–3:15 pm

CLINICAL CONTROVERSIES SESSION 1

L4/5 Lumbar Spondylolisthesis

MODERATORS: Paul C. McCormick, Alexander R. Vaccaro

SPEAKERS: Domagoj Coric, Daniel Hwan Kim, John E. O'Toole, Gerald E. Rodts, Juan Uribe

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

- Discuss the pathophysiology and etiology of low back pain and lumbar radiculopathy from spondylolisthesis.
- Review surgical approaches and advantages and disadvantages with each approach.
- Review clinical outcomes, measurements, and post-operative care.
- Apply these patient selection principles in their surgical management of patients with L4/5 lumbar spondylolithesis.

2:15–2:27 pm
MIS Decompression
Domagoj Coric

2:27–2:39 pm
Endoscopic Decompression
Daniel Hwan Kim

2:39–2:51 pm
XLIF
Juan Uribe

2:51–3:03 pm
TLIF
John E. O'Toole

3:03–3:15 pm
Open PLF
Gerald E. Rodts

TR 2:15–3:15 pm

NEW!

GUIDELINES SESSION 1

Guidelines for the Management of Traumatic Brain Injury

MODERATORS: M. Ross Bullock, Guy L. Clifton, Geoffrey T. Manley

SPEAKERS: Randall Matthew Chesnut, Jamshid Ghajar, Odette Harris, Jamie S. Ullman, Jack E. Wilberger

COURSE DESCRIPTION: The latest updates in Guidelines for the Management of Severe Traumatic Brain Injury have recently been released. 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. Don't miss out on this chance to get an essential summary and expert perspective on these guidelines.

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 traumatic brain injury.

2:15–2:27 pm
Overview of Guidelines/ Introduction and ICP Monitoring
Jamshid Ghajar

2:27–2:39 pm
Hypothermia / Nutrition
Odette Harris

2:39–2:51 pm
Ventilation / Blood Pressure
Jack E. Wilberger

2:51–3:03 pm
Thresholds
Randall Matthew Chesnut

3:03–3:15 pm
DVT
Jamie S. Ullman

CV 2:15–3:15 pm

NEW!

OPERATIVE NEUROSURGERY SESSION 1

Live Neuroendovascular Surgery: Novel Devices and Treatment Controversies

MODERATORS: Brian Lim Hoh, Henry H. Woo

SPEAKERS: Adam S. Arthur, Cameron G. McDougall, J D. Mocco, Adnan H. Siddiqui, Raymond D. Turner, Erol Veznedaroglu, Ajay K. Wakhloo

COURSE DESCRIPTION: Neuroendovascular surgery is one of the most rapidly changing, technology-driven fields in neurosurgery, with a continuous stream of novel devices and ground-breaking therapies. In a live demonstration with the VascSim simulator, experts will demonstrate alternative treatment strategies using different novel devices, some not yet available in the United States, for complex cerebrovascular cases.

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

- Participants will discuss alternative treatment strategies and different devices for acute ischemic stroke.
- Participants will discuss alternative treatment strategies and different neck-bridging devices for complex bifurcation aneurysms.
- Participants will discuss alternative treatment strategies using different flow diversion devices for the treatment of complex aneurysms.
- Develop increased competence in the endovascular application of these technologies within their own practice through live case demonstration.

2:15–2:35 pm
Acute Ischemic Stroke
J D. Mocco, Adnan H. Siddiqui

2:35–2:55 pm
Basilar Tip Aneurysm
Adam S. Arthur, Raymond D. Turner, Erol Veznedaroglu

2:55–3:15 pm
Giant Ophthalmic Aneurysm
Cameron G. McDougall, Ajay K. Wakhloo

SECTIONS/ORAL PRESENTATIONS

3:15–4:45 pm

SE COUNCIL OF STATE NEUROSURGICAL SOCIETIES

MODERATORS: Maya A. Babu, Gregory J. Murad

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

- Identify critical issues affecting neurosurgical graduate medical education.
- Identify five leadership skills important for neurosurgery.
- Discuss pipeline issues affecting neurosurgical trainee selection.

3:15–4:03 pm
Leadership and Education in Neurosurgery

4:03–4:45 pm
Oral Presentations
See page 50 for Oral Papers 101–107.

CV SECTION ON CEREBROVASCULAR SURGERY

MODERATORS: Brian T. Jankowitz, Scott Douglas Simon

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

- Discuss three upcoming trials evaluating the utility and benefit of intracranial hemorrhag evacuation.
- Identify how the trials will differ from one another.
- Apply lessons from the ongoing trials in their management of spontaneous intracerebral hemorhage.

3:15–4:15 pm
Oral Presentations
See pages 50–51 for Oral Papers 108–117.

4:15–4:45 pm
Drake Lecture
Gary K. Steinberg

SP SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES

Old Problems, New Solutions

MODERATORS: Domagoj Coric, Praveen V. Mummaneni

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

- Discuss up-to-date treatment paradigms for common surgical pathologies including cervical, thoracic and lumbar surgical conditions.
- Review the treatment of 1- and 2-level cervical pathologies in the outpatient setting with fusion and arthroplasty.
- Discuss the use of minimally invasive techniques for thoracic and lumbar pathologies from lateral and posterior approaches.
- Identify novel therapies for acute and subacute spinal cord injuries.
- Apply these MIS strategies and spinal cord injury data in the management of patients in their practice with spinal pathology.

3:15–3:25 pm
Pathologic Fracture with Cord Compression: Emergent Surgery vs. Tissue Diagnosis
Ali A. Baaj

3:25–3:35 pm
Anterior Cervical Surgery: Outpatient ACDF—Safety and Outcomes
Tim E. Adamson

3:35–3:45 pm
Anterior Cervical Surgery: Artificial Disc Replacement —Long-term Outcomes with 1- and 2-levels
Mark Edwin Shaffrey

3:45–3:55 pm
Lumbar Degenerative Spondylolisthesis/Stenosis: MIS TLIF Approach
Michael Y. Wang

3:55–4:05 pm
Lumbar Degenerative Spondylolisthesis/Stenosis: Lateral Approach
Adam S. Kanter

4:05–4:15 pm
Sagittal Imbalance: Lateral ALL Release
Kevin Scott Cahill

4:15–4:25 pm
Sagittal Imbalance: MIS Deformity Surgery
Paul Park

4:25–4:35 pm
Acute Spinal Cord Injury: Novel Treatment Modalities
Richard G. Fessler

4:35–4:45 pm
Subacute/Chronic Spinal Cord Injury: Novel Treatment Modalities
Allan D. Levi

TR SECTION ON NEUROTRAUMA AND CRITICAL CARE

MODERATORS: Rocco Armonda, Martina Stippler

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

- Discuss what roles, if any, halo vest fixation plays in the modern management of spinal trauma.
- Identify the role in counseling families on the risks of children playing football as it pertains to the risks of concussion.
- Apply these principles in counseling patients and patient selection for Halo fixation in their practice.

3:15–3:20 pm
Introduction of Marmarou Lecturer
Craig H. Rabb

3:20–3:50 pm
Marmarou Lecture
Julian E. Bailes

3:50–3:55 pm
Questions and Discussion

3:55–4:20 pm
Controversy: Halo-vest Fixation: Obsolete or Still Useful?

3:55–4:05 pm
Obsolete
Paul M. Arnold

4:05–4:15 pm
Still Useful
Craig H. Rabb

4:15–4:20 pm
Discussion

4:20–4:45 pm
Controversy: Should Children Play Football?

4:20–4:30 pm
Pro
Uzma Samadani

4:30–4:40 pm
Con
Jamie S. Ullman

4:40–4:45 pm
Discussion

PA SECTION ON PAIN

MODERATORS: Jason M. Schwalb, Mohammed F. Shamji

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

- Describe different stimulation paradigms of spinal cord stimulation for pain and their putative modes of action.
- List important areas for further knowledge development and research in the neurosurgical treatment of pain.
- Identify important ongoing clinical trials.

3:15–4:03 pm
Advances in Spinal Cord Stimulation

3:15–3:35 pm
Mechanisms of High Frequency SCS Examined with Computational Models
Scott Lempka

3:35–3:55 pm
Burst and High Frequency

SECTIONS/ORAL PRESENTATIONS

Spinal Cord Stimulation
Sven Vanneste

3:55–4:03 pm
Discussion and Questions

4:03–4:45 pm
Oral Presentations
See page 51 for Oral Papers 118–124.

PE SECTION ON PEDIATRIC NEUROLOGICAL SURGERY

MODERATORS: Lissa Baird, Lilliana Goumnerova

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

- Discuss the role of available treatment modalities for pediatric low-grade glioma, including the advantages and disadvantages of each, and their role in challenging cases.
- Identify current updates in clinical management of low-grade glioma using surgery, radiotherapy, and/or chemotherapy.
- Apply these management principles in their own treatment of low grade gliomas in practice.

3:15–4:03 pm
Pediatric Low-grade Gliomas: Treatment Updates and Case Discussion
MODERATORS: Lissa C. Baird, Lilliana Goumnerova

3:15–3:17 pm
Introduction
Lissa C. Baird

3:17–3:29 pm
The Role of Surgery
Jeffrey R. Leonard

3:29–3:41 pm
The Role of Radiotherapy
Kevin Murphy

3:41–3:53 pm
The Role of Chemotherapy
Kellie Nazemi

3:53–4:03 pm
Challenging Cases and Discussion
Panel

4:03–4:45 pm
Oral Presentations
See page 51 for Oral Papers 125–131.

SF SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY

MODERATORS: Emad Eskandar, Parag Patil

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

- Describe a novel technology to improve memory through neurosurgical intervention.
- Describe a novel technology to animate paralyzed limbs through neurosurgery.
- Describe recent advances in functional neurosurgical research.
- Apply these research advancements in their own selection of patients for this therapy.

3:15–4:03 pm
New Frontiers in Functional Neurosurgery

3:15–3:35 pm
Memory Aid for the Human Brain
Itzhak Fried

3:35–3:55 pm
Reanimating the Paralyzed Limbs: New Developments in FES and Brain Computer Interface
Jonathan Miller

3:55–4:03 pm
Discussion and Questions

4:03–4:45 pm
Oral Presentations
See pages 51-52 for Oral Papers 132–138.

TU SECTION ON TUMORS

MODERATORS: Isabelle M. Germano, Edjah K. Nduom, Ekkehard Matthias Kasper

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

- Discuss contemporary classification and genetics of ependymoma.
- Describe current management, both surgical and medical, for ependymomas affecting the brain and spine.
- Identify current controversies in the classification and management of ependymoma.

3:15–4:03 pm
Current Treatments for Ependymoma

3:15–3:31 pm
Epidemiology, Molecular Classification and WHO Grading of Ependymoma
Kristian Patjler

3:31–3:47 pm
Surgical Management of Intracranial and Spinal Ependymomas
Mark M. Souweidane

3:47–4:03 pm
Adjuvant Treatment
Mark R. Gilbert

4:03–4:45 pm
Oral Presentations
See page 52 for Oral Papers 139–145.

4:45–6:15 pm
SECTION POSTER VIEWING SESSION

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

- Discuss the findings of novel neurosurgical studies.
- Describe important areas for further research.
- Identify the most important ongoing clinical trials.

4:45–6:15 pm
Clinical Trials Update: Year in Review—What Every Neurosurgeon Should Know

MODERATORS: Brian Lim Hoh, Ganesh Rao

COURSE DESCRIPTION: In the rapidly changing world of evidence-based medicine, every neurosurgeon needs to know the results of the important clinical trials which will influence the management and treatment decision-making of patients. In this high-impact educational session, the results of major clinical trials reported over the past year, or important trials soon to be completed, will be presented by the principal investigators of the trials. Each trial will be evaluated by an expert to provide perspective.

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

- Discuss the major findings of important clinical trials in the treatment of brain tumors.
- Review the major findings of important clinical trials in the treatment of spinal disorders.
- Discuss the major findings of important clinical trials in the treatment of cerebrovascular conditions.
- Identify the major findings of important clinical trials in the treatment of traumatic brain injury.
- Apply these clinical trial findings to their management of these patient groups.

Dinner Seminar 02

Complimentary shuttle service will be provided for all dinner seminars. Shuttles will depart from the Marriott Marquis San Diego Marina Hotel.

Monday, September 26 • 7:00–9:30 pm • Fee: $190

SE DIN02

NEW!

New CPT Codes, ICD-10, MIPS, and Bundling: What These Challenges Mean to Your Bottom Line

MODERATORS: John K. Ratliff, Henry H. Woo

SPEAKERS: Clemens M. Schirmer, Philip W. Tally, Luis M. Tumialan

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

- Discuss the impact of ICD-10 implementation.
- Identify resources for ICD-10 implementation.
- Analyze the cost of ICD-10 implementation.
- Apply these lessons to the implementation of ICD-10 in their own practices.

BiCE

Located in the Gaslamp District, BiCE combines the comforts of true Italian hospitality and the fresh, wholesome ingredients of a real Italian marketplace. Innovative cuisine offers complex flavor combinations that will entice even the most ambitious connoisseur. Winner of the 2011, 2012, and 2014 Gold Medallion for "Best Italian Fine Dining" by the California Restaurant Association.

Dinner Seminar 03

Complimentary shuttle service will be provided for all dinner seminars. Shuttles will depart from the Marriott Marquis San Diego Marina Hotel.

Monday, September 26 • 7:00–9:30 pm • Fee: $190

TU DIN03

NEW!

Management of Meningiomas (Asymptomatic to Atypical)

MODERATORS: Randy L. Jensen

SPEAKERS: Ossama Al-Mefty, William T. Curry, Laligam N. Sekhar, Jason P. Sheehan

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

- Identify risk factors for meningioma progression.
- Describe management in the setting of gross total and subtotal meningioma resection.
- Apply existing evidence for adjuvant radiation and chemotherapy for meningiomas.
- Apply these data to counseling patients with asymptomatic or atypical meninigiomas.

Salvatore's Cucina Italiana

One of San Diego's fine premier dining spots, Salvatore's uses carefully sourced, fresh ingredients to create a refined, authentic Italian dining experience unlike any other. Founder and Executive Chef Raffaella Morelli, born and educated in Italy, has a philosophy of "hospitality over pretension," and all guests are treated like family.

T
9•27

TUESDAY, SEPTEMBER 27

PROGRAM HIGHLIGHTS

8:40–9:00 AM

FEATURED SPEAKER

Big Data's Impact on Medicine
Viktor Mayer-Schönberger

10:55–11:30 AM

NEUROSURGERY LECTURER

Moneyball: The Art of Winning an Unfair Game
Billy Beane

1:45–3:15 PM

CNS RESIDENT SANS CHALLENGE CHAMPIONSHIP ROUND

2:15–3:15 PM

OPERATIVE NEUROSURGERY SESSION 2

Live Endoscopic Endonasal Resection of Nonsecretory Pituitary Macroadenoma

4:45–5:15 PM

RAPID-EXCHANGE ORAL PRESENTATION SESSIONS

TUESDAY, SEPTEMBER 27

GENERAL SCIENTIFIC SESSION III

7:00–11:30 am

PRESIDING OFFICER: Michael P. Steinmetz

MODERATORS: Brian Lim Hoh, Krystal Lynne Tomei

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

- Discuss adaptions, advances, and achievements in the treatment of peripheral nerve diseases
  - in radiosurgery
  - in functional neurosurgery
  - in neurovascular surgery
- Apply these changes across neurosurgical subspecialties to their own practice

7:00–7:02 am
Introductions and Disclosures
Brian Lim Hoh

7:02–7:32 am
Best of the Best Oral Abstract Presentations

7:32–7:47 am
Adapting Findings from Rare Peripheral Nerve Diseases Can Lead to Broad Applications in Neurosurgery
Robert J. Spinner

7:47–8:02 am
Stereotactic Radiosurgery: The Revolutionary Advance in the Treatment of Spine Metastases
Mark H. Bilsky

8:02–8:07 am
AANS President
Frederick A. Boop

8:07–8:17 am
***Neurosurgery* Update**
Nelson M. Oyesiku

8:17–8:37 am
Honored Guest Presentation
Pathogenesis of Chiari I—Pathophysiology of Syringomyelia: Implications for Therapy
Edward H. Oldfield

8:37–8:40 am
Introduction of Viktor Mayer-Schönberger
Ashwini D. Sharan

8:40–9:00 am
Featured Speaker
Big Data's Impact on Medicine
Viktor Mayer-Schönberger

9:15–10:00 am
Book signing with Viktor Mayer Schonberger at the CNS booth in the Exhibit Hall

9:00–10:00 am
MORNING BEVERAGE BREAK
Visit the Exhibit Hall!

9:15–9:45 am
LIVE SURGERY
in the Exhibit Hall

10:00–10:17 am
Advancing Beyond DBS, New Avenues in Functional Neurosurgery: Adapting Endoventricular Near Infrared Illumination to Neuroprotection in Parkinson's Disease, and Achieving a Brain Driven Exoskeleton for Tetraplegic Patient
Alim-Louis Benabid

10:17–10:34 am
Advances in Disruptive Innovation in Neurovascular Surgery
Robert H. Rosenwasser

10:34–10:51 am
Adapting to the Rapid Transformation in Health Care: Can We Make Patient Care Safer
Alexander Vaccaro

10:51–10:55 am
Introduction of *Neurosurgery* Lecturer Billy Beane
Nelson M. Oyesiku

10:55–11:30 am
***Neurosurgery* Lecturer**
Moneyball: The Art of Winning an Unfair Game
Billy Beane

T 9•27

TUESDAY, SEPTEMBER 27 • 11:45 AM–1:15 PM

LUNCHEON SEMINARS

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

SANS supplemental exam is available for an additional $15.

NEW!

T16 Seven Aneurysms

MODERATOR: Michael T. Lawton

FACULTY: Daniel L. Barrow, Evandro De Oliveira, Rohen Harrichandparsad, Ali F. Krisht

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 the most important concepts of aneurysm microsurgery.
- Apply these techniques in their counseling of patients and surgical management of aneurysms.

PA

T17 Trigeminal Neuralgia Management Update

MODERATOR: Kim J. Burchiel

FACULTY: Abdessamad El Ouahabi, Anil Nanda, Jean Regis, Charles Teo

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

- Incorporate surgical, percutaneous, radiosurgical, and neuromodulation options for trigeminal neuralgia and facial pain syndromes into practice.
- Recognize the complications and outcomes with each treatment strategy.
- Summarize ongoing clinical studies which may impact future practice.

SP

T18 Cervical Arthroplasty: Is There a Role?

MODERATOR: Michael Y. Wang

FACULTY: Domagoj Coric, Regis W. Haid, Matthew McDonald

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

- Identify the indications for cervical arthroplasty.
- Summarize important literature regarding cervical arthroplasty.
- Describe the surgical techniques for cervical arthroplasty.
- Review the advantages and disadvantages of cervical arthroplasty compared to cervical fusion.

TU

NEW!

T19 Radiosurgery for Brain Metastases: Update and Controversies

MODERATOR: Douglas Kondziolka

FACULTY: Gene H. Barnett, William A. Friedman, Ajay Niranjan

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

- Describe the expanded indications and new approaches for brain metastasis radiosurgery.
- List the various imaging tools used to assess radiosurgery responses.
- Discuss the advantages and disadvantages of various radiosurgery techniques.

SP

T20 Managing Complications in Spine Surgery

MODERATOR: Gregory R. Trost

FACULTY: Paul M. Arnold, Michael W. Groff, Patrick W. Hitchon, Ali Kotb, Laurence D. Rhines, William Charles Welch

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

- Identify operative events dictating the need for intraoperative salvage techniques in spinal surgery.
- Discuss the specific techniques necessary to rectify intraoperative difficulties.
- Summarize intraoperative complications rates and variables impacting these statistics associated with spinal surgery.

TR

T21 Guidelines for Neurocritical Care Management

MODERATOR: Shelly D. Timmons

FACULTY: Kevin J. Gibbons, Robert E. Harbaugh, Leon Levi, Muhammad Raji Mahmud, Joshua E. Medow, Joseph C. Zacko

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

- Outline their strategies for managing traumatic brain injury.
- Assess current practice standards and practical issues surrounding management.
- Identify the unique challenges facing patients with traumatic brain injury.
- Apply these guidelines in their own neurocritical care practice.

SP

SANS supplemental exam is available for an additional $15.

T22 Peripheral Nerve Board Review

MODERATOR: Lynda Jun-San Yang

FACULTY: Francis Farhadi, Jason H. Huang, Rajiv Midha, Robert J. Spinner, Eric L. Zager

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

- Discuss the importance of developing a team-based approach in managing peripheral nerve syndromes.
- Describe different strategies and techniques that can be utilized to manage peripheral nerve syndromes.
- Create a multidisciplinary approach to dealing with peripheral nerve syndromes.

TU

T23 Mapping for Eloquent Tumors

MODERATOR: Alfredo Quinones-Hinojosa

FACULTY: William T. Curry, Mohamed E. El-Fiki, Nader Sanai, Jeffrey S. Weinberg

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

- Outline the indications for preoperative and intraoperative mapping for eloquent tumors.
- Describe the various mapping techniques used for patients with eloquent tumors.
- Summarize the impact of mapping on surgical outcomes and overall survival in patients with eloquent tumors.
- Introduce the operative room infrastructure requird to support eloquent tumor mapping into their own practice.

TU

SANS supplemental exam is available for an additional $15.

NEW!

T24 Malignant Glioma: Advances in Surgery and Adjuvant Therapy

MODERATOR: E. Antonio Chiocca

FACULTY: Jeffrey N. Bruce, Linda M. Liau, Emmy Nkusi, Ian F. Parney, Michael A. Vogelbaum

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.
- Apply these approaches in their respective practice.

PE

NEW!

T25 Pediatric and Adult Moyamoya Disease

MODERATOR: Gary K. Steinberg

FACULTY: Mohammad Ali Aziz-Sultan, R. Michael Scott, John E. Wanebo

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

- Define the epidemiology of Moyamoya disease in adults and children.
- Describe diagnostic workup for suspected Moyamoya.
- Summarize the surgical techniques used to treat Moyamoya.
- Apply these patient selection and surgical techniques in their own management or appropriate referral of Moyamoya patients.

TU

NEW!

T26 Meningioma: Management Strategies

Moderator: Michael William 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.
- Apply these treatment strategies in their own management of patients with meningiomas based on the enumerated selection criteria and surgical options.

SP

NEW!

T27 Managing Degenerative Thoracic Spine Disease

MODERATOR: Mark N. Hadley

FACULTY: Andrew T. Dailey, Mark E. Oppenlander, John Pollina, Abdel Hafiz Shehabuldin, Simcha Weller

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

- Discuss the diagnostic workup for patients with degenerative thoracic spine disease.
- Describe the role of a multidisciplinary approach for patients with thoracic spine degenerative disease.
- Summarize current guidelines related to surgical management of degenerative thoracic spine disease.
- Apply these guidelines in the management of patients in practice with thoracic spine disease.

CV

T28 Guidelines for Management of ICH and IVH

MODERATOR: Gregory J. Zipfel

FACULTY: E. Sander Connolly, Neil A. Martin, G. Edward Vates, Mario Zuccarello

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

- Discuss natural history of intracerebral hemorrhage.
- Identify traditional surgical and new minimally invasive options for management of intracerebral hemorrhage.
- Interpret indications, outcomes, and complications from these approaches.
- Identify cases in practice that may benefit from surgical management or csf diversion.

TR

NEW!

T29 Managing Intracranial Pressure in the Trauma Patient

MODERATOR: Geoffrey T. Manley

FACULTY: Randall M. Chesnut, Jack Jallo, Llewellyn Padayachy, Martina Stippler, Phillip B. Storm, Eve C. Tsai

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

- Identify techniques for monitoring intracranial pressure.
- Describe current guidelines regarding intracranial pressure management in the trauma patient.
- Discuss the importance of a team-based approach to trauma patients and intracranial pressure management.
- Apply intracranial pressure monitoring and management principles in their neurosurgical practice.

CV

NEW!

T30 Carotid Disease Management

MODERATOR: Robert E. Harbaugh

FACULTY: Fady T. Charbel, Edward A.M. Duckworth, Peter Kan, Byron Gregory Thompson

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

- Discuss the epidemiology and natural history of carotid artery disease.
- Outline clinical variables that impact treatment strategies.
- Describe the treatment strategies for carotid disease and summarize potential complications.
- Apply patient selection strategies regarding conservative management, CEA or carotid stenting in their treatment of patients with asymptomatic and symptomatic carotid disease.

TUESDAY, SEPTEMBER 27 • 1:15–3:15 PM

AFTERNOON SESSIONS

1:15–2:15 pm ***Visit the Exhibit Hall!***

AFTERNOON BEVERAGE BREAK

1:15–2:15 pm
ANNUAL BUSINESS MEETING

1:45–3:15 pm
CNS RESIDENT SANS CHALLENGE
Championship Round

CV 2:15–3:15 pm

CLINICAL CONTROVERSIES SESSION 2

Intracerebral Hemorrhage Management

MODERATORS: Steven L. Giannotta

SPEAKERS: Paul J. Camarata, E. Sander Connolly, Neil A. Martin, Howard A. Riina

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

- Discuss the indications, benefits, and risks for medical management of intraparenchymal hemorrhage.
- Identify the indications, benefits, and risks for emergent surgery for intraparenchymal hemorrhage.
- Review the indications, benefits, and risks for medical angiography and surgery for intraparenchymal hemorrhage.
- Apply these patient selection criteria in their practice management of ICH patients.

2:15–2:30 pm
Medical Management
Paul J. Camarata

2:30–2:45 pm
Emergent Surgery
Howard A. Riina

2:45–3:00 pm
Minimally Invasive Surgery
Neil A. Martin

3:00–3:15 pm
Angiogram and Surgery
E. Sander Connolly

TU 2:15–3:15 pm

NEW!

GUIDELINES SESSION 2

Guidelines for the Management of Brain Metastases

MODERATORS: Gene H. Barnett, Mark L. Rosenblum, Raymond Sawaya

SPEAKERS: Steven N. Kalkanis, Brian V. Nahed, Jeffrey J. Olson, Timothy C. Ryken, Andrew E. Sloan

COURSE DESCRIPTION: New updates on the Guidelines for the Management of Brain Metastases 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. Don't miss out on this chance to get an essential summary and expert perspective of these guidelines.

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.

2:15–2:27 pm
Whole Brain Radiation/ Multiple Brain Mets
Steven N. Kalkanis

2:27–2:39 pm
Surgical Resection
Brian V. Nahed

2:39–2:51 pm
Retreatment/Emerging Therapy
Jeffrey J. Olson

2:51–3:03 pm
Chemotherapy/Prophylactic Anticonvulsants/Steroid Use
Timothy C. Ryken

3:03–3:15 pm
Stereotactic Radiation/ Radiation Necrosis
Andrew E. Sloan

TU 2:15–3:15 pm

NEW!

OPERATIVE NEUROSURGERY SESSION 2

Live Endoscopic Endonasal Resection of Nonsecretory Pituitary Macroadenoma

MODERATORS: Paul A. Gardner, Gerald A. Grant, Gabriel Zada

SPEAKERS: James Evans, Marc Rosen

COURSE DESCRIPTION: This session will include live endoscopic endonasal surgery for resection of a large pituitary adenoma. The live surgery and moderating will be performed by Dr. James Evans (neurosurgery) and Dr. Marc Rosen (otolaryngology) from Thomas Jefferson University in Philadelphia. This session will cover the endonasal endoscopic surgical approach, tumor resection, reconstruction techniques, and methods to maximize efficiency of the neurosurgery and otolaryngology team during concurrent surgery. Particular emphasis will be placed on techniques for the preservation of normal sinonasal strutures and function, while achieving maximal tumor resection.

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

- Describe the steps for endoscopic endonasal resection of pituitary adenomas.
- Review techniques for the preservation of normal sinonasal strutures and function.
- Identify methods of maximizing efficiency when performing endonasal surgery concurrently with a neurosurgery and otolaryngology team.

SECTIONS/ORAL PRESENTATIONS

3:15–4:45 pm

SE COUNCIL OF STATE NEUROSURGICAL SOCIETIES

MODERATORS: Robert F. Heary, Cara L. Sedney

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

- Identify several state-based malpractice models.
- Discuss tail coverage versus umbrella liability coverage.
- Define what constitutes a defensive practice.
- Apply lessons from malpractice in practice planning within their local environments.

3:15–3:57 pm
Malpractice and Defensive Practices

3:57–4:45 pm
Oral Presentations
See pages 52–53 for Oral Papers 146–153.

CV SECTION ON CEREBROVASCULAR SURGERY

MODERATORS: Ramesh Grandhi, Brian T. Jankowitz, Scott Douglas Simon, Stavropoula I. Tjoumakaris

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

- Discuss the optimal endovascular neurosurgical team.
- List important areas for further knowledge development and research.
- Identify important ongoing clinical trials.
- Apply recent research in their treatment of cereborvascular disease.

3:15–3:45 pm
Oral Presentations
See page 53 for Oral Papers 154-158.

3:45–4:15 pm
Creating the Optimal Neurovascular Team
Brian T. Jankowitz, Scott L. Simon

3:45–3:55 pm
Accreditation/CAST Update
Adnan H. Siddiqui

3:55–4:15 pm
Perspective from Providers
Sepideh Amin-Hanjani, Tudor Jovin, Sean D. Lavine, Adnan H. Siddiqui, Aquilla S. Turk

4:15–4:45 pm
Intracerebral Hemorrhage Trial Updates
Ramesh Grandhi, Stavropoula I. Tjoumakaris

4:15–4:25 pm
ENRICH Update
Daniel L. Barrow

4:25–4:35 pm
MISTIE III Update
Mario Zuccarello

4:35–4:45 pm
INVEST Update
Adam S. Arthur

SP SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES

Oral Presentations

MODERATORS: Domagoj Coric, John J. Knightly

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 important ongoing clinical trials.
- Apply lessons from areas of active clinical research to their management of spinal disease patients.

See pages 53–54 for Oral Papers 159-173

SE SECTION ON NEUROTRAUMA AND CRITICAL CARE

Oral Presentations

MODERATORS: Kathryn M. Beauchamp, Sharon W. Webb

LEARNING OBJECTIVES: *Upon completion of this course, participants should 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 important ongoing clinical trials.
- Apply lessons from areas of active clinical research to their management of trauma patients.

See pages 54–55 for Oral Papers 174-188

PA SECTION ON PAIN

MODERATORS: Jonathan Miller, Ahmed M. Raslan

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

- Describe potential modes of action of spinal cord stimulation.
- Analyze the findings of novel neurosurgical studies in the treatment of pain; critique the design and methodology of these studies.
- List important areas for further knowledge development and research.
- Apply patient selection criteria to inform their offering or referral for spinal cord stimulation.

3:15–3:57 pm
New Frontiers and Mechanisms in Spinal Cord Stimulation

3:15–3:36 pm
Functional Imaging in Spinal Cord Stimulation
Milind Deogaonkar

3:36–3:57 pm
Intradural Spinal Cord Stimulation
Matthew A. Howard

3:57–4:45 pm
Oral Presentations
See page 55 for Oral Papers 189–196.

PE SECTION ON PEDIATRIC NEUROLOGICAL SURGERY

MODERATORS: Joshua Chern, Jorge Gonzalez-Martinez

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

- Identify suitable epilepsy surgery candidates for various modalities of invasive monitoring.
- Discuss the concepts and technical details of stereotactic EEG and seizure grid placement.

3:15–3:57 pm
Stereo-EEG versus Subdural Grids in Medically Intractable Pediatric Epilepsy

3:15–3:26 pm
Extra-operative Invasive Monitoring in Children: Matching Types of Epilepsy with the Adequate Exploratory Method
Juan Bulacio

3:26–3:37 pm
The SEEG Concept: The Anatomo-electroclinical Correlation Principle
Patrick Chauvel

3:37–3:48 pm
Technical Nuances of the Subdural Grid Method in Children
Gerald Grant MD

3:48–3:57 pm
The SEEG Methodology Applied to Children: Technical Aspects, Morbidity and Results
Jorge Gonzalez-Martinez.

3:57–4:45 pm
Oral Presentations
See pages 55–56 for Oral Papers 197–204.

TUESDAY, SEPTEMBER 27 • 3:15–4:45 PM

SECTIONS/ORAL PRESENTATIONS

SF SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY

MODERATORS: Aviva Abosch, Jason Schwalb

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

- Describe the economic factors that impact upon functional neurosurgery today.
- Describe the current characteristics of compensation and workload in functional neurosurgery.
- Describe recent advances in functional neurosurgical research.
- Apply these lessons to the development of a functional neurosurgery practice and inform the care of patients with movement disorders or pain syndromes.

3:15–3:57 pm
The Socioeconomics of Functional Neurosurgery

3:15–3:36 pm
Financial Challenges and Opportunities in Functional Neurosurgery
Andre Machado

3:36–3:57 pm
Compensation and Workload of Functional Neurosurgeons: A National Survey
Joshua Rosenow

3:57–4:45 pm
Oral Presentations
See page 56 for Oral Papers 205–212.

TU SECTION ON TUMORS

MODERATORS: Costas G. Hadjipanayis, Ian Yu Lee, Uzma Samadani

SPEAKERS: Linda M. Liau, Michael Lim, Ian F. Parney

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

- Describe experimental viral treatments for GBM.
- Describe new vaccine treatments for GBM which enhance the host immune response.
- Review new chemotherapies and antibody based treatments which represent a new immunological strategy for treating GBM.

3:15–3:57 pm
Immunotherapies for GBM
MODERATOR: Ian Yu Lee

3:15–3:29 pm
Viral Treatments
Ian F. Parney

3:29–3:43 pm
Vaccine Therapies
Linda M. Liau

3:43–3:57 pm
Checkpoint Inhibitors and Antibody-based Treatments
Michael Lim

3:57–4:45 pm
Oral Presentations
MODERATORS: Costas G. Hadjipanayis, Uzma Samadani
See pages 56–57 for Oral Papers 213–220.

4:45–5:15 pm

RAPID-EXCHANGE ORAL PRESENTATION SESSIONS

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

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

5:15–6:15 pm

SECTION POSTER VIEWING SESSION

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

- Discuss the findings of novel neurosurgical studies.
- Describe important areas for further research.
- Identify important ongoing clinical trials.
- Apply lessons of ongoing research to neurosurgical care of patients.

5:45–6:45 pm
RESIDENT RECRUITMENT SOCIAL
Come build relationships at this relaxed and informal networking event. If you are within 2-3 years of completing your residency, this event is perfect for you! Establish a network of contacts with recruiters and practicing physicians who are looking to add to their practice.

Dinner Seminar 04

Complimentary shuttle service will be provided for all dinner seminars. Shuttles will depart from the Marriott Marquis San Diego Marina Hotel.

Tuesday, September 27 • 7:00–9:30 pm • Fee: $190

TR DIN04

NEW!

Concussion: Diagnosis, Management, and Outcomes

MODERATOR: Shelly D. Timmons

SPEAKERS: Tanvvir Choudhri, James M. Johnston, Krystal Lynne Tomei, Jamie S. Ullman, Alex B. Valadka

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

- Recognize signs and symptoms of concussion.
- Manage progressive return to play after concussion.
- Identify risks factors for repeated concussion.
- Describe outcomes after concussion.
- Use these data to inform counseling of patients suffering from concussion.

Seasons 52

Seasons 52 is a celebration of what's good now. In this casually sophisticated setting, a seasonally inspired menu features ingredients at their peak of freshness, and rustic cooking techniques like brick oven roasting and open-fire grilling bring out natural flavors. Named one of San Diego's best spots for wine pairings.

WEDNESDAY, SEPTEMBER 28

PROGRAM HIGHLIGHTS

7:03–7:51 AM

TOP LATE-BREAKING SCIENCE AND TOP 5 RAPID-EXCHANGE ORAL PRESENTATIONS

8:16–8:32 AM

HONORED GUEST PRESENTATION

Spinal Dural Arteriovenous Fistulas: 40 Years of Progress—Unanswered Issues
Edward H. Oldfield

2:15–3:15 PM

CLINICAL CONTROVERSIES SESSION 3

Epilepsy Associated Cavernomas

3:15–3:45 PM

RAPID-EXCHANGE ORAL PRESENTATION SESSIONS

WEDNESDAY, SEPTEMBER 28

GENERAL SCIENTIFIC SESSION IV

7:00–11:30 am

PRESIDING OFFICER: Ganesh Rao

MODERATORS: Bernard R. Bendok, Nader Pouratian

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

- Discuss adaptions, advances, and achievements:
  - in the treatment of spinal dural arteriovenous fistulas
  - in the treatment of spinal cord injury
  - in neuroendoscopy
  - in the future of cranial neurosurgery
- Apply presented advancements across these subspecialties to their neurosurgical practice.

7:00–7:03 am
Introductions and Disclosures
Bernard R. Bendok

7:03–7:51 am
Top 3 Late Breaking Abstracts/Top 5 Rapid-exchange Oral Presentations

7:51–7:54 am
Announcement of Top Posters
James S. Harrop

7:54–8:06 am
2015 Getch Award Winner Presentation
Akash J. Patel

8:06–8:16 am
CNS Resident Award Presentation
Differential Gender Response to Aspirin in Decreasing Aneurysm Rupture in Humans and Mice
Nohra Chalouhi

8:16–8:32 am
Honored Guest Presentation
Spinal Dural Arteriovenous Fistulas: 40 Years of Progress—Unanswered Issues
Edward H. Oldfield

8:32–8:48 am
Translational Advances in the Management of Acute Spinal Cord Injury: What is New? What is Hot?"
Michael G. Fehlings

8:48–8:50 am
Introduction of Japanese CNS President
Shekar N. Kurpad

8:50–9:00 am
Japanese CNS Presidential Address
Shinichi Yoshimura

9:00–10:00 am
MORNING BEVERAGE BREAK
Visit the Exhibit Hall!

9:15–9:45 am
LIVE SURGERY
in the Exhibit Hall

10:00–10:15 am
Advancing the Neuroscience of Human Memory Through Neurosurgery
Kareem A. Zaghloul

10:15–10:30 am
IDH Mutation and Glioma Surgery: Advances in Surgical Strategy
Daniel P. Cahill

10:30–10:45 am
Neuroendoscopy to Achieve Superior Glioma Resection Outcomes
Charles Teo

10:45–11:05 am
Redefining the Second Opinion: There's an App for that. An mCase Expert Panel Forum
Roger Hartl, Praveen Mummaneni, Mark E. Oppenlander, Paul Park, Nicholas Theodore

11:05–11:30 am
The Future of Cranial Neurosurgery—Adapting New Approaches
Ricardo Jorge Komotar

11:05–11:07 am
Introduction
Ricardo Jorge Komotar

11:07–11:12 am
Lasar Ablation
Shabbar F. Danish

11:12–11:17 am
Brainpath
John Diaz Day

11:17–11:22 am
MR Focused Ultrasound
Gelareh Zadeh

11:22–11:30 am
Illustrative Case Examples
Ricardo Jorge Komotar

WEDNESDAY, SEPTEMBER 28 • 11:45 AM–1:15 PM

LUNCHEON SEMINARS

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).

SP

NEW!

W31 Guidelines for Acute Cervical Spine and Cord Injuries

MODERATOR: Mark N. Hadley

FACULTY: Bizhan Aarabi, Francis Farhadi, R. John Hurlbert, Nicholas Theodore, Ian Vlok

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

- Identify advances in the medical treatment of traumatic spinal cord injury.
- Determine state-of-the-art surgical management of cervical spine trauma and spinal cord injury.
- Write protocols for identifying and assessing cervical spine injury in the comatose patient.
- Apply these protocols and data to the care of cervical spine injured patients in their practice.

CV

W32 Lessons Learned: Avoidance and Management of Complications of Aneurysm Surgery

Moderator: Giuseppe Lanzino

FACULTY: David J. Chalif, Hasan Kocaeli, Ali F. Krisht, Christopher S. Ogilvy,

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

- Discuss the common complications in aneurysm surgery.
- Describe management of complications occurring during aneurysm surgery.
- List the different techniques available to manage complications with adjunctive technologies.
- Apply management strategies for complication avoidance in their surgical treatment of aneurysms.

TU

NEW!

W33 Skull Base Endoscopy: Utility and Limitations

Moderator: Charles Teo

FACULTY: Paul A. Gardner, Fred Gentili, G. Michael Lemole, Zachary N. Litvack, Daniel M. Prevedello

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

- Identify potential complications associated with endoscopic skull base surgery.
- Discuss factors influencing the surgical strategy in patients with skull base lesions.
- Describe the current state-of-the-art in endoscopic skull base surgery.
- Apply these surgical management strategies in the care of skull base lesions.

CV

W34 Hematology and Coagulation for Neurosurgeons: Dangers and Solutions

MODERATOR: R. Loch Macdonald

FACULTY: David M. Hasan, Alan S. Hoffer, Pascal Jabbour, Shahid Mehdi Nimjee

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

- Recognize that neurosurgeons commonly face acute perioperative and intraoperative decisions regarding the diagnosis and management of coagulopathy that are crucial to patient safety and excellent outcomes.
- Explain important coagulation mechanisms, parameters, indications, and clinical pearls to their current strategy.
- List important screening guidelines and define the key points of emergency and intraoperative coagulation management.
- Apply these guidelines in their management of coagulopathic patients and reversal of pharmacological agents in the setting of neurosurgical pathology.

PE

W35 Chiari Malformation

MODERATOR: Jeffrey R. Leonard

FACULTY: Richard C. E. Anderson, Souad Bakhti, John D. Heiss, David D. Limbrick, Karin M. Muraszko

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

- Outline management strategies for patients with Chiari malformation.
- Describe the natural history of Chiari disease and review the prognosis after surgery.
- Summarize the radiographic criteria and clinical findings for Chiari malformation.
- Apply these patient selection principles in the management of Chiari patients in their practice.

TR

W36 Neurovascular Emergencies: Case-based Discussion

Moderator: E. Sander Connolly

FACULTY: Sepideh Amin-Hanjani, Nicholas C. Bambakidis, Bernard R. Bendok, Peter Nakaji, Shinichi Yoshimura

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

- Discuss the incidence of various types of neurovascular emergencies.
- Outline management strategies for neurovascular emergencies.
- Describe common complications and methods for avoidance.
- Recognize these neurovascular emergencies in their practice and apply the presented management strategies in patient care.

SP

NEW!

W37 Guidelines for Managing the Aging Spine

Moderator: Michael G. Fehlings

FACULTY: Paul M. Arnold, Andrew T. Dailey, John J. Knightly, Marjorie Wang, Christopher E. Wolfla, Ahmed Yehia

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

- Discuss the natural history of spinal degenerative disease.
- Review indications for surgical treatment for elderly patients with spinal disease.
- Describe current practice standards and long-term management strategies for degenerative spinal disease.

PE TR

NEW!

W38 Pediatric Head Trauma and Sports

MODERATOR: Michael L. Levy

FACULTY: Eri Anthon, Eric M. Jackson, James M. Johnston, Eve C. Tsai

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

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

SF

NEW!

W39 Minimally Invasive Deformity: New Frontiers

MODERATORS: Adam Kanter, Praveen V. Mummaneni

FACULTY: David O. Okonkwo, Paul Park, Mohammed F. Shamji, Khoi Duc Than

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

- Describe the epidemiology and natural history of spinal deformity.
- Discuss current concepts in minimally invasive spinal deformity surgery.
- Strategize how to identify and avoid complications in minimally invasive spinal deformity surgery.
- Apply MIS strategies in the treatment of patients with spinal deformity.

SE

NEW!

W40 From Residency to Practice: Getting the Job You Want and What to Ask For

MODERATOR: Clemens M. Schirmer

FACULTY: Daniel J. Hoh, Alexander Arash Khalessi, Shahid Mehdi Nimjee, Nader Sanai

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.
- Describe the key elements of negotiating your first contract.
- Apply these strategies in retaining neurosurgical employment.

CV

NEW!

W41 Hemorrhagic Stroke for Neurosurgeons

MODERATOR: Sean D. Lavine

FACULTY: Mohammad Ali Aziz-Sultan, Aman B. Patel, Adnan Hussain Siddiqui, Henry H. Woo

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Summarize guidelines and indications for treatment of intracerebral hematoma.
- Describe novel devices used to treat intracerebral hematoma.
- Discuss current literature and recent clinical trials on hemorrhagic stroke.
- Apply these guidelines in the management of ICH and recognize opportunities to introduce novel endoscopic techniques into their practice.

SF

NEW!

W42 Epilepsy: Current and Emerging Treatment Strategies

MODERATOR: Guy M. McKhann II

FACULTY: Warren W. Boling, Edward F. Chang, Jeffrey G. Ojemann, Jason M. Schwalb, Kareem A. Zaghloul

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Incorporate emerging treatment strategies for epilepsy into your practice.
- Discuss the importance of a multimodality approach to epilepsy patients.
- Summarize the current guidelines regarding epilepsy treatment.

GE

NEW!

W43 Women in Neurosurgery: Becoming a Neurosurgery Leader: Mentorship

MODERATORS: Isabelle Germano, Stacey Quintero Wolfe

FACULTY: Judy Huang, Anne-Marie Flannery, Yoko Kato, Linda Liau, Shelly Timmons

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Interface with mentors and create a personalized strategy for career leadership development.
- Improve one's efficacy as both a mentee and mentor.
- Identify the evidence-based impact of mentoring on residents and faculty careers.
- Develop knowledge on mentoring platforms and their significance on leadership.

1:15–2:15 pm ***Visit the Exhibit Hall!***

AFTERNOON BEVERAGE BREAK

TU SF

2:15–3:15 pm

CLINICAL CONTROVERSIES SESSION 3

Epilepsy Associated Cavernomas

MODERATOR: Guy M. McKhann II

SPEAKERS: Robert M. Friedlander, Murat Gunel, Jean Regis

LEARNING OBJECTIVES: *Upon completion of this course, participants will be able to:*
- Discuss the indications, benefits, and risks for surgical resection of cavernous malformations.
- Recognize the indications, benefits, and risks for surgical resection with mapping of cavernous malformations.
- Evaluate the indications, benefits, and risks for monitoring of cavernous malformations.

2:15–2:35 pm
Operate
Robert M. Friedlander

2:35–2:55 pm
Operate with Mapping
Guy McKhann, Jean Regis

2:55–3:15 pm
Monitor
Murat Gunel

SP

2:15–3:15 pm

GUIDELINES SESSION 3

Guidelines for the Management of Thoracolumbar Fractures

MODERATORS: Daniel K. Resnick, John E. O'Toole

SPEAKERS: John Chi, Andrew Dailey, Sanjay S. Dhall, Kurt M. Eichholz, Craig H. Rabb

COURSE DESCRIPTION: New updates on the Guidelines for the Management of Thoracolumbar Fractures 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. Don't miss out on this chance to get an essential summary and expert perspective 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 versus 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.

2:15–2:27 pm
Issues in the Medical Management of Traumatic Thoracic and Lumbar Spine Fractures
Sanjay S. Dhall

2:27–2:39 pm
Operative Versus Non-operative Treatment for Traumatic Thoracic and Lumbar Spine Fractures
Craig H. Rabb

2:39–2:51 pm
Timing of Surgical Intervention for Traumatic Thoracic and Lumbar Spine Fractures
Kurt M. Eichholz

2:51–3:03 pm
Surgical Approaches for the Management of Traumatic Thoracic and Lumbar Fractures
Andrew Dailey

3:03–3:15 pm
Novel Surgical Strategies for Traumatic Thoracic and Lumbar Spine Fractures
John Chi

3:15–3:45 pm

RAPID-EXCHANGE ORAL PRESENTATION SESSIONS

LEARNING OBJECTIVES: *Upon completion of this course, participants should 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.

See pages 58–62 for the Rapid Exchange Oral Presentation listings.

ABSTRACTS /ORAL PRESENTATIONS

M 26 COUNCIL OF STATE NEUROSURGICAL SOCIETIES ORAL PRESENTATIONS

4:03–4:09 pm
101 Medicare Expenditures for Elderly Patients Undergoing Surgical Clipping or Endovascular Intervention for Subarachnoid Hemorrhage
Kimon Bekelis, Dan Gottlieb, Todd MacKenzie, Giuseppe Lanzino, Michael T. Lawton, Stavropoula I. Tjoumakaris, Pascal Jabbour

4:09–4:15 pm
102 Patient Safety in Neurosurgical Practice: Physician Factors that Contribute to Patient Injury
Christopher L. Taylor, Darrell Ranum

4:15–4:21 pm
103 Insurance Status Predicts Patient Safety and Care Quality in the Lumbar Spine Fusion Population
Joseph E. Tanenbaum, Vincent J. Alentado, Jacob A. Miller, Daniel Lubelski, Edward C. Benzel, Thomas E. Mroz

4:21–4:27 pm
104 The Effect of Surgical Start Time and Day of the Week on Morbidity and Mortality for Neurological Surgeries
Joseph Raynor Linzey, M. Amr Sabbagh, Aditya S. Pandey

4:27–4:33 pm
105 The Effect of Socioeconomic Status on Gross Total Resection, Radiation Therapy, and Overall Survival in Patients With Gliomas
Sayantan Deb, Arjun Vivek Pendharkar, Sean Altekruse, John K. Ratliff, Atman Desai

4:33–4:39 pm
JULIUS GOODMAN RESIDENT AWARD
106 Effect of Complications Within 90-days on Cost-utility Following Elective Surgery for Degenerative Lumbar Spine Disease
Silky Chotai, Ahilan Sivaganesan, Scott L. Parker, Joseph Wick, David P. Stonko, Matthew J. McGirt, Clinton J. Devin

4:39–4:45 pm
107 Evaluating the Costs of Follow-up Imaging Protocol for Endovascularly Treated Unruptured Intracranial Aneurysms: A Multicenter Study
Raghav Gupta, Christoph Johannes Griessenauer, Nimer Adeeb, Justin M. Moore, Apar S. Patel, Michelle Hui Juan Chua, Ajith J. Thomas, Christopher S. Ogilvy

M 26 SECTION ON CEREBROVASCULAR SURGERY ORAL PRESENTATIONS

3:15–3:21 pm
SYNTHES CEREBROVASCULAR AWARD
108 Adverse Events After Carotid Endarterectomy: A National Surgical Quality Improvement Program Analysis
Hormuzdiyar H. Dasenbrock, Timothy R. Smith, William B. Gormley, Kai U. Frerichs, Mohammad Ali Aziz-Sultan, Rose Du

3:21–3:27 pm
GALBRAITH AWARD
109 Multimodal Endovascular Endoscopy in Carotid Atherosclerotic Disease
Luis E. Savastano, Arlene Smith, Karla Vega, Carlos Murga-Zamalloa, David Gordon, Micheal Wang, B. Gregory Thompson, Eric Seibel, Thomas Wang

3:27–3:33 pm
110 Non-inferiority of a Direct Aspiration First-pass Technique Versus Stent Retriever Thrombectomy in Emergent Large-vessel Intracranial Occlusions
Christopher J. Stapleton, Collin M. Torok, Aman B. Patel

3:33–3:39 pm
111 Predictors of Complications After Clipping of Unruptured Intracranial Aneurysms: A National Surgical Quality Improvement Program Analysis
Hormuzdiyar H. Dasenbrock, Robert F. Rudy, William B. Gormley, Timothy R. Smith, Kai U. Frerichs, Mohammad Ali Aziz-Sultan, Rose Du

3:39–3:45 pm
112 Stereotactic Radiosurgery for Intracranial Arteriovenous Malformations With Intranidal and Prenidal Arterial Aneurysms
Dale Ding, Zhiyuan Xu, Robert M. Starke, Chun-Po Yen, Han-Hsun Shih, Thomas Buell, Jason P. Sheehan

3:45–3:51 pm
113 Initial Experience With an Image-guided Robotically Positioned Optical Platform for Aneurysm Surgery
Amin B. Kassam, Srikant S. Chakravarthi, Juanita Celix, Melanie Fukui, Jonathan Jennings, Sarika Walia, Richard A. Rovin

3:51–3:57 pm
114 Treatment of Bifurcation Aneurysms Using Single Stent-coiling with Relation to Aneurysm Configuration: A Cohort Study of Two Academic Institutions in the United States
Nimer Adeeb, Apar S. Patel, Christoph Johannes Griessenauer, Justin M. Moore, Paul M. Foreman, Raghav Gupta, Mark R. Harrigan, Christopher S. Ogilvy, Ajith J. Thomas

3:57–4:03 pm
115 The Southwestern Aneurysm Scoring Index (SASI) Prediction of Outcomes at One Year in Ruptured Aneurysms Treated With Microsurgery
Vin Shen Ban, Jeffrey S. Beecher, Christopher S. Eddleman, Salah G. Aoun, Kristopher Allen Lyon, Tarek Youssef El Ahmadieh, Cameron Michael McDougall, Babu Guai Welch, Joan Reisch, H. Hunt Batjer, Duke S. Samson, Jonathan A. White

4:03–4:09 pm
116 Effect of Annual Hospital Procedure Volume on Outcomes After Mechanical Thrombectomy in Acute Ischemic Stroke Patients: An Analysis of 13,502 Procedures
Vishal B. Jani, Chiu Yuen To, Achint Patel, Prashant S. Kelkar, Boyd Richards, Richard D. Fessler, II

4:09–4:15 pm
117 Quantitative CT Ventriculography for Assessment and Monitoring of Hydrocephalus: A Pilot Study and Description of Method in Subarachnoid Hemorrhage (SAH)
Eric Karl Oermann, Jasjit Multani, Justin Robert Mascitelli, Branko Skovrlj, Margaret Pain, Kelly Nicole, Joseph Titano, Anthony Costa, Raj K. Shrivastava

M 26 SECTION ON PAIN ORAL PRESENTATIONS

4:03–4:09 pm
RONALD R. TASKER YOUNG INVESTIGATOR AWARD
118 Use of Spinal Cord Diffusion Tensor Imaging to Quantify Neural Ablation and Evaluate Outcome After Percutaneous Cordotomy for Intractable Cancer Pain
Aditya Vedantam, Ping Hou, Linda Chi, Patrick M. Dougherty, Ashwin Viswanathan

4:09–4:15 pm
120 Effects of Subthalamic Deep Brain Stimulation with Duloxetine on Mechanical and Thermal Thresholds in 6OHDA-Lesioned Rats
Ian Thomas Walling, Brian C. Kaszuba, Lucy Gee, Damian Shin, Julie G. Pilitsis

4:15–4:21 pm
121 Rate of Peri-operative Neurological Complications After Surgery for Cervical Spinal Cord Stimulation
Andrew Kai-Hong Chan, Ethan A. Winkler, Line Jacques

4:21–4:27 pm
122 Pulse Modulation of the Occipital Nerve Using Focused High-intensity Ultrasound Improves Mechanical Thresholds in a Chronic Migraine Rat Model
Ian Thomas Walling, Lucy Gee, Paul Neubauer, Lance Frith, Emery Williams, Clif Burdette, Julie G. Pilitsis

4:27–4:33 pm
123 Patient Perspectives Regarding Ethics of Neuromodulators in the Treatment of Persistent Postoperative Neuropathic Pain
Nardin Samuel, Suneil Kumar Kalia, Mark A. Bernstein, Mohammed F. Shamji

4:33–4:39 pm
124 Low Back Pain Relief With a New 32-Contact Surgical Lead and Neural Targeting Algorithm
Julie G. Pilitsis, Giancarlo Barolat, Joshua M. Rosenow, James J. Brennan, Alexander S. Bailey, Jeffrey M. Epstein, Blake Hammond, Clark Metzger, Dat Huynh, Kristen Lechleiter, Nitzan Mekel-Bobrov

M 26 SECTION ON PEDIATRIC NEUROLOGICAL SURGERY ORAL PRESENTATIONS

4:03–4:09 pm
125 Transorbital Ultrasound Measurement as a Non-invasive Marker of Intracranial Pressure (ICP)
Llewellyn Padayachy, Graham A. G. Fieggen

4:09–4:15 pm
126 Anatomy of Cerebellar Mutism: Reduced Fractional Anisotropy in the Superior Cerebellar Peduncle
Sean D. McEvoy, Amy Lee, Jeffrey G. Ojemann, Christine MacDonald

4:15–4:21 pm
127 Multimodality Word-finding Distinctions in Pediatric Cortical Stimulation Mapping
Naomi D. Chou, Sandra Serafini, Gerald A. Grant, Merlise Clyde, Jordan Komisarow, Carrie R. Muh

4:21–4:27 pm
128 Application of Cortical Bone Trajectory Instrumentation for Juvenile and Adolescent Idiopathic Scoliosis
Vishal J. Patel, Ken Maynard, III, Randall Zain Allison, Thomas Frank, Daniel Branch, Aaron Mohanty

4:27–4:33 pm
129 Using MRI to Establish Patency Between Adjacent CSF Compartments
Matt Borzage, Edward F. Melamed, Skorn Ponrartana, Stefan Bluml, Eisha Christian, J. Gordon McComb

4:33–4:39 pm
130 Skull Base Chordomas in Children and Young Adults
M. Maher Hulou, Marcio S. Rassi, Kaith Almefty, Wenya Linda Bi, Ian F. Dunn, Timothy R. Smith, Ossama Al-Mefty

4:39–4:45 pm
131 Resective Surgery for Focal Cortical Dysplasia in Children: A Comparative Analysis of the Utility of Intraoperative Magnetic Resonance Imaging (iMRI).
Chima Oluigbo, Matthew Sacino, John S. Myseros, Suresh N. Magge, William Gaillard, Robert F. Keating

M 26 SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY ORAL PRESENTATIONS

4:03–4:09 pm
STEREOTACTIC AND FUNCTIONAL NEUROSURGERY RESIDENT AWARD
132 A Randomized, Sham-controlled Trial of Transcranial MR Guided Focused Ultrasound Thalamotomy Trial for the Treatment of Tremor-dominant, Idiopathic Parkinson's Disease
Aaron E. Bond, Robert Dallapiazza, Diane Huss, Amy L. Warren, Scott Sperling, Ryder Gwinn, Binit B. Shah, W. Jeffrey Elias

4:09–4:15 pm
133 The Development of Human ES-derived Dopamine Neurons for Clinical Use in Parkinson's Disease
Viviane S. Tabar

4:15–4:21 pm
134 VANTAGE Trial: Three Year Outcomes of a Prospective, Multi-center Trial Evaluating Deep Brain Stimulation with a New Multiple-source, Constant-current Rechargeable System in Parkinson's Disease
Lars Timmermann, Roshini Jain, Lilly Chen, Thomas Brucke, Fernando Seijo, Esther Suarez San Martin, Claire Haegelen, Marc Verin, Veerle Visser-Vandewalle, Michael T. Barbe, Steven Gill, Alan Whone, Mauro Porta, Domenico Servello, François Alesch

4:21–4:27 pm
135 A Comparison of Outcomes Between Deep Brain Stimulation (DBS) Under General Anesthesia Versus Conscious Sedation with Awake Evaluation
François Alesch, Roshini Jain, Lilly Chen, Thomas Brucke, Fernando Seijo, Esther Suarez San Martin, Claire Haegelen, Marc Verin, Mohammed Maarouf, Michael T. Barbe, Steven Gill, Alan Whone, Mauro Porta, Domenico Servello, Lars Timmermann

4:27–4:33 pm
136 Field-steering Rescue Lead Therapy for Patients With Essential Tremor Refractory to VIM DBS
Vishad Sukul, David A. Isaacs, Srivatsan Pallavaram, William Rodriguez, Jonathan Butler, Hong Yu, Joseph Samir Neimat, Peter Konrad

4:33–4:39 pm
137 An Easily Implemented, Open Access Semi-Automated Pipeline for Intracranial Electrode Localization
Timothy G. Dyster, Yagna Pathak, Elliot Smith, Sameer A. Sheth

4:39–4:45 pm
138 Delayed Scalp Erosion After DBS Surgery: Incidence, Treatment, Outcomes and Prevention
Justin D. Hilliard, Alberto Bona, Sasha Vaziri, Roger Walz, Michael S. Okun, Kelly D. Foote

M 26 SECTION ON TUMORS ORAL PRESENTATIONS

4:03–4:09 pm
NATIONAL BRAIN TUMOR SOCIETY MAHALEY CLINICAL RESEARCH AWARD
139 Clinically Applicable and Biologically Validated MRI Radiomic Test Method Predicts Glioblastoma Genomic Landscape and Survival
Pascal O. Zinn, Sanjay K. Singh, Aikaterini Kotrotsou, Faramak Zandi, Ginu Thomas, Masumeh Hatami, Markus M. Luedi, Ahmed Elakkad, Islam Hassan, Joy Gumin, Erik P. Sulman, Frederick F. Lang, Rivka R. Colen

4:09–4:15 pm
BRAINLAB NEUROSURGERY AWARD
140 Genome-wide CRISPR/cas9 Knock-out Screens in Human Glioblastoma Identify Genetic Vulnerabilities
Imran Noorani

4:15–4:21 pm
JOURNAL OF NEURO-ONCOLOGY AWARD
141 Phase I Trial of Genetically Modified Hematopoietic Progenitor Cells (HPC) Facilitate Bone Marrow Chemoprotection and Enabling TMZ/O6BG Dose Escalation Resulting in Improved Survival
Andrew E. Sloan, Hua Fung, Jane Reese, Lisa R. Rogers, Christopher Murphay, Hillard Lazrus, Boro Dropulic, Stan L. Gerson

4:21–4:27 pm
142 Genetic and Non-genetic Determinants of Cellular Architecture in IDH1-mutant Oligodendrogliomas and Astrocytomas Using Single Cell Transcriptome Analysis
Andrew Sean Venteicher, Itay Tirosh, Christine Hebert, Leah Escalante, Robert L. Martuza, Brian V. Nahed, William T. Curry, Jr., Daniel P. Cahill, Bradley Bernstein, David N. Louis, Aviv Regev, Mario Suva

4:27–4:33 pm
AMERICAN BRAIN TUMOR ASSOCIATION YOUNG INVESTIGATOR AWARD
143 Identification of Neoantigen-specific CD8+ T Cells in Two Murine Orthotopic Glioblastoma Models Using Cancer Immunogenomics
Tanner M. Johanns, Jeffrey Ward, Courtney Wilson, Dale K. Kobayashi, Diane Bender, Yujie Fu, Anton Alexandrov, Maxim N. Artyomov, Chris A. Miller, Elaine R. Mardis, Gavin P. Dunn

4:33–4:39 pm
PREUSS AWARD
144 GPR133 Promotes Glioblastoma Growth in Hypoxia
Nermin Sumru Bayin, Joshua Frenster, J. Robert Kane, Aram Modrek, Nadim Shohdy, Douglas J. MacNeil, David Zagzag, Dimitris G. Placantonakis

4:39–4:45 pm
STRYKER NEURO-ONCOLOGY AWARD
145 Unplanned Reoperation After Craniotomy for Tumor: A National Surgical Quality Improvement Program Analysis
Hormuzdiyar H. Dasenbrock, Sandra C. Yan, Vamsidhar Chavakula, William B. Gormley, Timothy R. Smith, Elizabeth Claus, Ian F. Dunn

T 27 COUNCIL OF STATE NEUROSURGICAL SOCIETIES ORAL PRESENTATIONS

3:57–4:03 pm
146 Routine Outpatient Imaging Follow-up for Subdural Hematomas Provides Limited Clinical Benefit
Thomas Gianaris, Shaheryar Ansari, Richard B. Rodgers

4:03–4:09 pm
147 Patient Perceptions About Quality of Care in Spinal Disorders
Cheerag D. Upadhyaya, Kate Wan-Chu Chang, Shawn Brown, Tara Beach, Shawn L. Hervey-Jumper, Aditya S. Pandey, Paul Park, Lynda Jun-San Yang

4:09–4:15 pm
148 Predictive Model for Return to Work After Elective Surgery for Lumbar Degenerative Disease: An Analysis from National Neurosurgery Quality Outcomes Database Registry
Anthony L. Asher, Silky Chotai, Clinton J. Devin, Kristen Archer-Swygert, Scott L. Parker, Mohamad Bydon, Nian Hui, Frank Harrell, Theodore Speroff, Robert Dittus, Sharon Philips, Christopher I. Shaffrey, Kevin T. Foley, Matthew J. McGirt, N2QOD Investigative Group

4:15–4:21 pm

SAMUEL HASSENBUSCH YOUNG NEUROSURGEON AWARD

149 Does Ranking of Surgeons in a Publicly Available Online Platform Correlate With Objective Outcomes?

Kimon Bekelis, Symeon Missios, Shannon Michael Coy, Jeremiah N. Johnson

4:21–4:27 pm

150 Providing Video Recordings of Neurosurgical Clinical Visits Does Not Increase Provider Risk and May Lower Costs and Save Office Time: Experience of 6,112 Cases

Andrew J. Meeusen, Randall W. Porter

4:27–4:33 pm

151 Race and Insurance Status are Associated with Higher Charges in Patients Having Pituitary Tumor Surgery in New York State

Edward Vates, Amy Lalonde, Charles Lee, Kristopher T. Kimmell, Laura Calvi, Tanzy Love, Matthew C. Miller

4:33–4:39 pm

152 A Prospective Controlled Trial of the Effect of Surgeon Cost Scorecards on Operating Room Surgical Cost Reduction (OR SCORE)

Corinna Clio Zygourakis, Victoria Valencia, Chris Moriates, Christy Boscardin, Sereina Catschegn, Andrew Goldberg, Kevin Bozic, Kent Soo Hoo, Rosanna Wustrack, Lawrence H. Pitts, Adams Dudley, Ralph Gonzales, Michael T. Lawton

4:39–4:45 pm

153 Significant Inter-Hospital Variation in Cranial Surgery Costs Using the Nationwide Inpatient Sample (NIS) Database

Corinna Clio Zygourakis, Caterina Liu, Philip V. Theodosopoulos, Michael T. Lawton, Adams Dudley, Ralph Gonzales

T 27 SECTION ON CEREBROVASCULAR SURGERY ORAL PRESENTATIONS

3:15–3:21 pm

154 Expression Quantitative Trait Locus Analysis from Primary Immune Cells Identifies Novel Regulatory Effects Underlying Intracranial Aneurysms Susceptibility

Ahmed J. Awad, Joshua B. Bederson, J. Mocco, Towfique Raj

3:21–3:27 pm

155 Enhanced Stem Cell Delivery by Functional Blood-Brain Barrier Modulation Improves Neurologic Recovery in a Rodent Stroke Model

Michael J. Lang, Ruihe Lin, Ashwini Dayal Sharan, Robert H. Rosenwasser, Lorraine Iacovitti

3:27–3:33 pm

156 Effect of Associated Arterial Aneurysms on Outcomes After Stereotactic Radiosurgery for Intracranial Arteriovenous Malformations: A Matched Cohort Study

Dale Ding, Zhiyuan Xu, Robert M. Starke, Chun-Po Yen, Han-Hsun Shih, Thomas Buell, Jason P. Sheehan

3:33–3:39 pm

157 Open and Endovascular Treatment of Spinal Dural Arteriovenous Fistulae: A 10-year Experience

Matthew Koch, Christopher J. Stapleton, Pankaj Kumar Agarwalla, Collin M. Torok, John H. Shin, Jean-Valery Coumans, Lawrence F. Borges, Christopher S. Ogilvy, James D. Rabinov, Aman B. Patel

3:39–3:45 pm

158 Morphological Parameters for Anterior Communicating Artery Aneurysm Rupture Risk Assessment

Tanmoy Kumar Maiti, Shyamal C. Bir, Devi Prasad Patra, Hugo Cuellar, Anil Nanda

T 27 SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES ORAL PRESENTATIONS

3:15–3:21 pm

159 Neurological Outcomes of Two-level TDR Versus ACDF: Seven-year Results from a Prospective, Randomized, Multicenter Trial

Robert Jackson, Darin Eric Johnson

3:21–3:27 pm

160 Outpatient Surgery for Herniated Cervical Disc and Fusion is Feasible and Safe, a Consecutive Single-center Series of 759 Patients

Bjarne Lied, Oystein Helseth, Kare Ekseth, Ben Heskestad, Eirik Helseth

3:27–3:33 pm

161 Patient-reported Outcomes After Epidural Steroid Injections Versus Surgery for Degenerative Lumbar Disease: A Prospective, Matched Cohort Study

Ahilan Sivaganesan, Silky Chotai, Scott L. Parker, Matthew J. McGirt, Clinton J. Devin

3:33–3:39 pm

162 Tobacco Smoking and Outcomes of Surgical Decompression in Patients with Symptomatic Degenerative Cervical Spondylotic Myelopathy

Paul M. Arnold, Branko Kopjar, Lindsay Tetreault, Hiroaki Nakashima, Michael G. Fehlings

3:39–3:45 pm

163 Microstructural MRI Quantifies Tract-specific Injury and Correlates with Global Disability and Focal Neurological Deficits in Degenerative Cervical Myelopathy

Allan R. Martin, Benjamin De Leener, Julien Cohen-Adad, Izabela Aleksanderek, David W. Cadotte, Sukhvinder Kalsi-Ryan, Lindsay Tetreault, Adrian Crawley, Howard J. Ginsberg, Michael G. Fehlings

3:45–3:51 pm

164 Failure Rates and Complications of Interspinous Process Decompression Devices: A European Multicenter Study

Marcelo Galarza y Vicentini, Roberto Gazzeri, Pedro De la Rosa, Claudio Piqueras

3:51–3:57 pm
165 What is the Effect of Open Versus Percutaneous Screws on Complications Among Patients Undergoing Lateral Interbody Fusion for Adult Spinal Deformity?
Khoi Duc Than, Stacie Nguyen, Paul Park, Dean Chou, Frank La Marca, Juan S. Uribe, Todd Douglas Vogel, Pierce D. Nunley, Robert Eastlack, Neel Anand, Adam S. Kanter, Praveen V. Mummaneni, Gregory M. Mundis, Jr., International Spine Study Group

3:57–4:03 pm
166 Predictive Modeling of Length of Hospital Stay (LOS) Following Adult Spinal Deformity (ASD) Correction: Analysis of 653 Patients with an Accuracy of 75% Within Two Days
Justin K. Scheer, Tamir T. Ailon, Justin S. Smith, Robert Hart, Douglas C. Burton, Shay Bess, Brian J. Neuman, Peter G. Passias, Emily Miller, Christopher I. Shaffrey, Frank Schwab, Virginie Lafage, Eric Klineberg, Christopher P. Ames

4:03–4:09 pm
167 Reducing Radiation an Order of Magnitude During Fluoroscopic-guided Kyphoplasty
Isaac O. Karikari, Chris Brown, D. Gregg Anderson, Debbie Chi

4:09–4:15 pm
168 Impact of Initial Clinical and Imaging Parameters on Long-term Neurological Outcomes in Acute Traumatic Cervical Spinal Cord Injury
Sunil Kukreja, Jan Schwab, Francis Farhadi

4:15–4:21 pm
169 Laminoplasty Versus Laminectomy with Posterior Spinal Fusion for Multilevel Cervical Spondylotic Myelopathy: Matched Cohorts of Regional Sagittal Balance
Darryl Lau, Ethan A. Winkler, Khoi Duc Than, Dean Chou, Praveen V. Mummaneni

4:21–4:27 pm
170 The Accuracy of Multimodality Intraoperative Neuromonitoring to Predict Postoperative Neurological Deficits Following Cervical Laminoplasty
John Frederick Burke, Junichi Ohya, Todd Douglas Vogel, Michael Virk, Dean Chou, Praveen V. Mummaneni

4:27–4:33 pm
171 Resurgery in Craniovertebral Junction Abnormalities
Pavaman Pandit Sindgikar, Kuntal Kanti Das, Awadesh K. Jaiswal, Rabi Narayan Sahu, Arun K. Srivastava, Anant Mehrotra, Jayesh Chunilal Sardhara, Kamlesh Singh Bhaisora, Sanjay Behari

4:33–4:39 pm
172 A Phase I, Open-label, Single-site, Safety Study of Human Spinal Cord-derived Neural Stem Cell Transplantation for the Treatment of Chronic Spinal Cord Injury
Erik Curtis, Brandon C. Gabel, Martin Marsala, Joseph D. Ciacci

4:39–4:45 pm
173 A Clinical and Radiographic Score to Assess Malignant Potential of Peripheral Nerve Sheath Tumors
Jonathan Yun, Christopher J. Winfree

T 27 SECTION ON NEUROTRAUMA AND CRITICAL CARE ORAL PRESENTATIONS

3:15–3:21 pm
THINKFIRST AWARD
174 Mechanisms of Injury as a Diagnostic Predictor of Sport Related Concussion Severity in Football, Basketball, and Soccer: Results from a Regional Concussion Registry
Scott L. Zuckerman, Doug Totten, Kolin Rubel, Andrew W. Kuhn, Aaron M. Yengo-Kahn, Gary Solomon, Allen K. Sills, Jr.

3:21–3:27 pm
175 Safety of Anticoagulation for the Treatment of Cerebral Venous Sinus Thrombosis in Adult Trauma Patients
David S. Hersh, Erik Hayman, Bizhan Aarabi, Deborah Stein, Cara Diaz, Jennifer Massetti, Gary Thomas Schwartzbauer
3:27–3:33 pm

3:27–3:33 pm
176 Andexanet Alfa, an Investigational Universal Antidote for Reversal of Anticoagulation of Factor Xa Inhibitors in Healthy Human Volunteers
Florie Mar, Mark Crowther, Alex Gold, Genmin Lu, Janet Leeds, Brian Wiens, Vandana Mathur, Janice Castillo, Pamela Conley, Stuart Connolly, John Curnutte

3:33–3:39 pm
177 Largest Series of Mild-Moderate MVA Associated Thoracolumbar Compression Fractures: Prognosis and Outcome Hesham M. Soliman, Ha Nguyen, Frank A. Pintar, Narayan Yoganandan, Shekar N. Kurpad, Dennis J. Maiman

3:39–3:45 pm
178 High AIS Grade Conversion Rate Following Neuro-Spinal Scaffold Implantation in Acute Thoracic Complete AIS A Spinal Cord Injury (SCI): Potential Mechanisms
Nicholas Theodore, Kee Duk Kim, Patrick C. Hsieh, Wilson Zachary Ray, Maureen Barry, Rick Layer, Simon W. Moore, Domagoj Coric

3:45–3:51 pm
179 Chemogenetic Stimulation of the Lumbar Locomotor Network Enhances Motor Function Following Experimental Cervical Spinal Cord Injury: Translational Relevance for a Novel Therapeutic Strategy
Spyridon K. Karadimas, Kajana Satkunendrarajah, Michael G. Fehlings

3:51–3:57 pm
180 Early DVT Chemoprophylaxis in Traumatic Brain Injury
Fabio Frisoli, Paul P. Huang, Spiros Frangos

3:57–4:03 pm
181 Guidelines for the Management of Patients with Spinal Cord Injury: The Optimal Timing of Decompression Jefferson R. Wilson, Lindsay Tetreault, Bizhan Aarabi, Paul A. Anderson, Paul M. Arnold, Darrel S. Brodke, Anthony Burns, Robert Chen, Kazuhiro Chiba, Joseph Dettori, Julio C. Furlan, James S. Harrop, Langston T. Holly, Tara Jeji, Sukhvinder Kalsi-Ryan, Mark Kotter, Shekar N. Kurpad, Brian K. Kwon, Ralph Marino, Allan R. Martin, Eric M. Massiocotte, Geno Merli, James Middleton, Hiroaki Nakashima, Narihito Nagoshi, Katherine Palmieri, Mohammed F. Shamji, Anoushka Singh, Andrea Skelly, Albert Yee, Michael G. Fehlings

4:03–4:09 pm
DEPUY SYNTHES AWARD FOR RESIDENT RESEARCH ON SPINAL CORD AND SPINAL CORD INJURY
182 Ultra-early (<12 Hours) Decompression Improves Recovery After Spinal Cord Injury (SCI) Compared to Early (12-24 Hours) Decompression
John Frederick Burke, John K. Yue, Laura Benjamin Ngwenya, Ethan A. Winkler, Jason Talbott, Jonathan Pan, Adam Ferguson, Michael Beattie, Jacqueline Bresnahan, Jenny Haefeli, William Whetstone, Catherine Suen, Michael C. Huang, Geoffrey T. Manley, Phiroz E. Tarapore, Sanjay S. Dhall

4:09–4:15 pm
183 A Clinical Risk Score for Managing Children with GCS 13-15 Head Injuries and Intracranial Injury
Jacob K. Greenberg, Yan Yan, Christopher Carpenter, Angela Lumba-Brown, Martin S. Keller, Jose A. Pineda, Ross C. Brownson, David D. Limbrick, Jr.

4:15–4:21 pm
184 Interrelationships Among Neuroimaging Biomarkers, Neuropsychological Test Data, and Symptom Reporting in a Cohort of Retired National Football League (NFL) Players
Andrew W. Kuhn, Scott L. Zuckerman, Gary Solomon, Ira Casson

4:21–4:27 pm
DEPUY SYNTHES AWARD FOR RESIDENT RESEARCH ON BRAIN AND CRANIOFACIAL INJURY
185 The Utility of Thromboelastography for Predicting the Risk of Progression of Intracranial Hemorrhage in Traumatic Brain Injury Patients
Abigail J. Rao, Amber Laurie, Cole Hilliard, Rochelle Fu, Tori Lennox, Ronald Barbosa, Martin Schreiber, Susan Rowell

4:27–4:33 pm
186 Deferoxamine Accelerates Hemorrhage Absorption for Patients with Traumatic Intracerebral Hematoma: A Prospective Randomized Controlled Trial
Jian Yu

4:33–4:39 pm
187 Prospective Study of Futile Care in the Neuroscience Intensive Care Unit
Simon Buttrick, Kristy O'Phelan, Kenneth Goodman, Ronald Jay Benveniste

4:39–4:45 pm
188 Morbidity and Mortality Associated with Operative Management of Traumatic C2 Fractures in Octogenarians
Ethan A. Winkler, John K. Yue, John Frederick Burke, Praveen V. Mummaneni, Geoffrey T. Manley, Phiroz E. Tarapore, Sanjay S. Dhall

T 27 SECTION ON PAIN ORAL PRESENTATIONS

3:57–4:03 pm
189 Comparison of Efficacy of Tonic and Burst Occipital Nerve Stimulation in Treating Trigeminal Allodynia: Chronic Result
Shannon Wang Clark, Lalit Venkatesan, David Boorman, Nathan Fried, Michael Oshinsky, Ashwini Dayal Sharan, Melanie Elliott

4:03–4:09 pm
190 A Comparative Analysis of Operative and Radiographic Findings of Neurovascular Compression of the Trigeminal Nerve in Patients Without Trigeminal Neuralgia
Raymond F. Sekula, Jr., Marion Hughes, Hossein Mousavi

4:09–4:15 pm
191 Comparing Percutaneous Treatments of Trigeminal Neuralgia with Long-term Outcomes
Imran Noorani, O. Sparrow, Girish Vajramani

4:15–4:21 pm
192 Older Patients Have Greater Improvements in Pain Score Following Microvascular Decompression
Sarah K.B. Bick, David Huie, Emad N. Eskandar

4:21–4:27 pm
193 The Morphology of the Cod Dorsal Horn–implications for DREZ Surgery Using Suction of the Gray Substance as the Lesioning Method
Milan Spaic

4:27–4:33 pm
194 Efficacy of Primary Microvascular Decompression Versus Salvage Microvascular Decompression For Trigeminal Neuralgia
C. Rory Goodwin, Debebe Theodros, Nancy A. Abu-Bonsrah, Matt Bender, Xin Zhou, Rafael De la Garza-Ramos, Dimitrios Mathios, Tomas Garzon-Muvdi, Ari M. Blitz, Alessandro Olivi, Benjamin S. Carson, Chetan Bettegowda, Michael Lim

4:33–4:39 pm
195 How Well Do Neuroradiologists Predict the Side of Trigeminal Neuralgia?
Amparo M. Wolf, Ingrid Aguiar-Littig, Girish Fatterpekar, Douglas Kondziolka

4:39–4:45 pm
196 High Resolution Magnetic Resonance Imaging in Trigeminal Neuralgia: Added Benefit of Contrast Enhanced Constructive Interference in Steady State (CISS) Imaging
C. Rory Goodwin, Daniel Seeburg, Benjamin Northcutt, Jaehoon Shin, Debebe Theodros, Nancy A. Abu-Bonsrah, Daniel Herzka, Nafi Aygun, Ari M. Blitz, Michael Lim

T 27 SECTION ON PEDIATRIC NEUROLOGICAL SURGERY SESSION 2 ORAL PRESENTATIONS

3:57–4:03 pm
197 Considerations in Relationship to the Approach for the Treatment of Lateralized Posterior Fossa Tumors in Children
Mark Calayag, Brandon C. Gabel, David S. Hong, Dustin Hatefi, David D. Gonda, Hal S. Meltzer, Michael L. Levy

4:03–4:09 pm
198 Effectiveness of Surgical Revascularization for Stroke Prevention in Pediatric Patients with Sickle Cell Disease(SCD) and Moyamoya Syndrome(MMS)
Wuyang Yang, Jose Luis Porras, Jr., Risheng Xu, Tomas Garzon-Muvdi, Justin M. Caplan, Geoffrey P. Colby, Alexander Lewis Coon, Rafael J. Tamargo, Judy Huang, Edward Sanghoon Ahn

4:09–4:15 pm
199 Multiple Concussions in Young Athletes: Identifying Patients at Risk for Repeat Injury
Meghan Murphy, Brandon A. McCutcheon, Panagiotis Kerezoudis, Lorenzo Rinaldo, Daniel Levi Shepherd, Patrick R. Maloney, Marcus J. Gates, Mohamad Bydon

4:15–4:21 pm
200 Age as a Novel Risk Factor for Revision of Ventriculopleural Shunt in Pediatric Patients
Edward F. Melamed, Eisha Christian, Mark D. Krieger, Cherisse Berry, Parham Yashar, J. Gordon McComb

4:21–4:27 pm
COLUMBIA SOFTBALL CHARITY AWARD
201 Transnasal Endoscopic Approach for Pediatric Skull Base Tumors: A Case Series
Jennifer L. Quon, Peter H. Hwang, Michael S. B. Edwards

4:27–4:33 pm
202 Predictors of Surgical Treatment and Postoperative Complications in the Pediatric Patient with Isolated Tethered Cord Syndrome
Osama Kashlan, D. Andrew Wilkinson, Hal Morgenstern, Cormac O. Maher

4:33–4:39 pm
203 Insular Depth Electrode in Pediatric Treatment-Refractory Epilepsy
Luke Tomycz

4:39–4:45 pm
204 Pediatrics Arterovenous Malformations Treatment with Stereotactic Radiosurgery Gamma Knife: Our Institutional Experience
Jody Filippo Capitanio, Alberto Luigi Gallotti, Pietro Panni, Silvia Snider, Francesco Scomazzoni, Pietro Mortini

T 27 SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY ORAL PRESENTATIONS

3:57–4:03 pm
205 Tractography Characterizing Lesions Differentiating Responders to Stereotactic Capsulotomy for OCD
Pranav Nanda, Garrett P. Banks, Yagna Pathak, Danika L. Paulo, Guillermo Horga, Marcelo Q. Hoexter, Zhiyuan Xu, Antonio Lopes, Nicole McLaughlin, Benjamin Greenberg, Jason P. Sheehan, Euripides C. Miguel, Sameer A. Sheth

4:03–4:09 pm
206 Spikes, Slowing, and Functional Connectivity: Multimodal MEG in Epilepsy Surgery
Dario J. Englot, John David Rolston, Doris D. Wang, Heidi E. Kirsch, Srikantan S. Nagarajan, Edward F. Chang

4:09–4:15 pm
207 Aberrant Preoperative Hippocampal Interconnectivity Predicts Verbal Memory Improvement Following Anterior Temporal Lobectomy
Philip Lee, Ahmad Alhourani, Robert Mark Richardson

4:15–4:21 pm
208 Connectivity-based Functional Parcellation and Localization of the Human Supplementary Motor Area Based on Rest-fMRI and its Utility in Brain Tumor Surgery
Fengping Zhu, Dongxiao Zhuang, Qiang Luo, Tianming Qui, Jinsong Wu, Jianfeng Feng, Ying Mao

4:21–4:27 pm
209 Movement-related Dynamics of Beta Band Causal Interactions Between STN and Sensorimotor Cortex Revealed Through Intraoperative Recordings in Parkinson's Disease
Ahmad Alhourani, Anna Korzeniewska, Thomas A. Wozny, Efstathios Kondylis, Witold J. Lipski, Donald Crammond, R. Mark Richardson

4:27–4:33 pm
210 Human Sensorimotor Electrocorticography: Spectral Dynamics and Network Connectivity During a Simple Motor Task
Vivek Buch, John Frederick Burke, Ashwin G. Ramayya, Cameron Brandon, Eric Hudgins, Andrew Richardson, Timothy H. Lucas, II

4:33–4:39 pm
211 Cortical Oscillations During Memory Encoding are Reinstated on a Faster Time Scale During Memory Recall
Ammar Shaikhouni, Robert Yaffe, Sara Inati, Kareem A. Zaghloul

4:39–4:45 pm
212 A Distributed Network for Emotional and Non-emotional Conflict Processing
Matthew Kamal Mian, Emad N. Eskandar

T 27 SECTION ON TUMORS ORAL PRESENTATIONS

3:57–4:03 pm
INTEGRA FOUNDATION AWARD
213 HDAC Inhibitor Vorinostat is a Novel, Promising Treatment for Cushing's Disease
Prashant Chittiboina, Jie Lu, Xiang Wang, Martin G. Piazza, Zhengping Zhuang

4:03–4:09 pm
214 Fractal Structure in Volumetric Contrast Enhancement of Malignant Gliomas Correlates with Oxidative Metabolic Pathway Gene Expression
Kai Miller, Sharon Berendsen, Tatjana Seute, Kristen Yeom, Melanie Gephart Hayden, Gerald A. Grant, Pierre Robe

4:09–4:15 pm
215 Post-operative Stereotactic Radiosurgery Versus Observation for Completely Resected Brain Metastases: Results of a Prospective Randomized Study
Ganesh Rao, Salmaan Ahmed, Kenneth Hess, Anita Mahajan

4:15–4:21 pm
216 Human Fat-derived Mesenchymal Stem Cells Bioengineered to Secrete BMP4 are Non-Oncogenic, Suppress Glioma, and Prolong Survival
Sara Ganaha, Rawan Al-Kharboosh, Alejandro Ruiz-Valls, Hugo Guerrero-Cazares, Alfredo Quinones-Hinojosa

4:21–4:27 pm
217 YAP is Ready to Rac and Rho: Elucidation of a Novel YAP-driven Network That Potentiates Brain Cancer Cell Dispersal and Confers Poor Survival in Patients
Sagar R. Shah, Nathaniel Tippens, JinSeok Park, Ahmed Mohyeldin, Guillermo Vela, Juan Carlos Martinez-Gutierrez, Seth S. Margolis, Susanne Schmidt, Andre Levchenko, Alfredo Quinones-Hinojosa

4:27–4:33 pm
218 Meningioma Driver Mutations Determine Their Anatomical Site of Origin
Murat Gunel, Yale-Bonn-Cologne Brain Tumor Genetics Study Group

4:33–4:39 pm
219 Liquid Biopsy Can Distinguish Recurrent GBM from Pseudoprogression and Radiation Necrosis After Concurrent Radiochemotherapy
Andrew E. Sloan, David Soler, Anne B. Young, Kelvin D. Cooper, Thomas McCormic

4:39–4:45 pm
SYNTHES SKULL BASE SURGERY AWARD
220 Expanded Anterior Petrosectomy Through the Transcranial Middle Fossa and Extended Endoscopic Transphenoidal-Transclival Approaches: Qualitative and Quantitative Anatomic Analysis
Aurel Hasanbelliu, Norberto O. Andaluz, Alberto Di Somma, Jeffrey T. Keller, Lee Zimmer, Myles L. Pensak, Ravi Samy, Mario Zuccarello

RAPID-EXCHANGE ORAL PRESENTATIONS

RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 1

MODERATORS: Robert F. James, Elias Boulos Rizk

4:45–4:48 pm
302 Vessel Wall Enhancement on MRI After Stent-retriever Thrombectomy
Peter Abraham, Vincent J. Cheung, Roland Lee, Jeffrey Scott Pannell, Mihir Gupta, Robert Rennert, Alexander Arash Khalessi

4:48–4:51 pm
303 Aneurysmal Subarachnoid Hemorrhage Patients' Risk Assessment for Shunting (aSAH-PARAS): An International Collaborative Study and Initiation of a Consortium
Hadie Adams, Vin Shen Ban, Ville Leinonen, Salah G. Aoun, Jukka Huttunen, Taavi Saavalainen, Antti Lindgren, Juhana Frosen, Mikael Fraunberg, Timo Sakari Koivisto, Juha Antero Hernesniemi, Babu Guai Welch, Juha Jaaskelainen, Terhi J Huttunen

4:51–4:54 pm
304 The Contribution of Whole Platelet Aggregometry to the Endovascular Management of Unruptured Aneurysms: An Institutional Experience
Babu Guai Welch, Salah G. Aoun, G. Lee Pride, Kim L. Rickert, Jonathan A. White, Kathryn Hoes, Robin Novakovic, R. Sarode

4:54–4:57 pm
305 The INVEST Trial: A Randomized, Controlled Trial to Investigate the Safety and Efficacy of Image-guided Minimally Invasive Endoscopic Surgery with Apollo Versus Best Medical Management for Supratentorial Intracerebral Hemorrhage
David Fiorella, Adam S. Arthur, J D. Mocco

4:57–5:00 pm
306 Worse Stereotactic Radiosurgery Outcomes for Intracranial Arteriovenous Malformations After Repeat Versus Initial Treatment: A Matched Cohort Study
Dale Ding, Zhiyuan Xu, Han-Hsun Shih, Robert M. Starke, Chun-Po Yen, Or Cohen-Inbar, Jason P. Sheehan

5:00–5:03 pm
307 Is Catheter Diagnostic Cerebral Angiography Still Essential for Patients with Spontaneous Perimesencephalic Subarachnoid Hemorrhage and Negative CT Angiogram?
Ahmed Galal, Tarek H. ElSerry, Mohamed Mostafa Aziz

5:03–5:06 pm
308 High-resolution MRI Findings Following Trigeminal Rhizotomy
C. Rory Goodwin, Benjamin Northcutt, Daniel Seeburg, Jaehoon Shin, Debebe Theodros, Nancy A Abu-Bonsrah, Daniel Herzka, Nafi Aygun, Ari M Blitz, Michael Lim

5:06–5:09 pm
309 Middle Fossa Approach to Lateralized Pontine Cavernomas in Children
Mark Calayag, Reid Hoshide, David D. Gonda, Hal S. Meltzer, Takanori Fukushima, Michael L. Levy

5:09–5:12 pm
310 Predictors of Preoperative Developmental Delay in Nonsyndromic Sagittal Craniosynostosis
Eisha Christian, Thomas Imahiyerobo, Alexis Johns, Pedro Sanchez, Mark D. Krieger, J. Gordon McComb, Mark Urata

RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 2

MODERATOR: Kevin S. Cahill

4:45–4:48 pm
311 Smith-Robinson Procedure with an Autologous Iliac Crest Bone Graft with and without Caspar Plating as a Treatment for Soft Cervical Disc Herniation—Report of 122 Patients with an Average Follow-up of 25 years
Benedikt W. Burkhardt, Moritz Brielmeier, Karsten Schwerdtfeger, Joachim M.K. Oertel

4:48–4:51 pm
312 Risk Factors and Clinical Outcomes of Dysphagia After Anterior Cervical Surgery in Patients with Degenerative Cervical Myelopathy: Results from the AOSpine International and North America Studies
Lindsay Tetreault, Narihito Nagoshi, Hiroaki Nakashima, Paul M. Arnold, Giuseppe Barbagallo, Branko Kopjar, Michael G. Fehlings

4:51–4:54 pm
313 Impact of Intra-operative Steroids on Post-operative Infection Rates and Length of Hospital Stay: A Study of 1200 Spine Surgery Patients
Aladine A. Elsamadicy, Timothy Y. Wang, Isaac O. Karikari, Oren N. Gottfried

4:54–4:57 pm
314 Minimally Invasive Oblique Lateral Interbody Fusion for L4-5: Clinical Outcomes and Peri-operative Complications
Jin-Sung Kim, Won Suh Choi, Ji Hoon Sung

4:57–5:00 pm
315 Race as a Predictor of Postoperative Hospital Readmission After Spine Surgery
Joel Martin, Timothy Y. Wang, Daniel B. Loriaux, Rupen Desai, Owoicho Adogwa, Maragatha Kuchibhatla, Isaac O. Karikari, Carlos Antonio Bagley, Oren N. Gottfried

5:00–5:03 pm
316 MRI Analysis of the Combined AOSpine North America and International Studies, Part I: The Prevalence and Spectrum of Pathologies in a Global Cohort of Patients with Degenerative Cervical Myelopathy
Aria Nouri, Allan R. Martin, Lindsay Tetreault, Anick Nater, So Kato, Hiroaki Nakashima, Narihito Nagoshi, Hamed Reihani-Kermani, Michael G. Fehlings

5:03–5:06 pm
317 Clinical Outcome of Transspinous Approach in Comparison with Conventional Laminectomy for Lumbar Degenerative Stenosis
Aysegul Ozdemir Ovalioglu, Erhan Emel, Emre Tacyildiz, Cem Ovalioglu, Muslum Gunes, Levent Uysal, Aysegul Esen Aydin

5:06–5:09 pm
318 Lumbar Disc Surgery: Clinical Outcome of 85 Patients with a Mean Follow-up of 32 Years
Benedikt W. Burkhardt, Marietta Grimm, Karsten Schwerdtfeger, Joachim M.K. Oertel

5:09–5:12 pm
319 Predictive Value of Intraoperative Neurophysiological Monitoring During Spine Surgery: A Prospective Analysis of 4489 Consecutive Patients
Matthew Pease, Gurpreet Surinder Gandhoke, Jaspreet Kaur, Parthasarthy Thirumala, Jeffrey Balzer, Donald Crammond, David O. Okonkwo, Adam S. Kanter

5:12–5:15 pm
320 Association Between Hemoglobin A1c and Reoperation Following Spine Surgery
Jacob A. Miller, Matthew Richard Webb, Edward C. Benzel, Thomas Mroz, Eric Mayer

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RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 3

MODERATORS: Kathryn M. Beauchamp, Uzma Samadani, Sameer A. Sheth

4:45–4:48 pm
321 Development of Intrathecal Riluzole (itRIL): A New Route of Administration for the Treatment of Amyotrophic Lateral Sclerosis (ALS) Patients
Juanmarco Gutierrez, Thais Federici, Bethany Peterson, Ray Bartus, Alexandre Betourne, Nicholas M. Boulis

4:48–4:51 pm
322 High-resolution Small Vessel Imaging with Rotational Angiography CT for Stereotactic EEG Trajectory Planning
Michael J. Lang, Chengyuan Wu, Pascal Jabbour, Ashwini Dayal Sharan

4:51–4:54 pm
323 The Role of the Temporal Pole in Temporal Lobe Seizure Networks: An Intracranial Electrode Investigation.
Taylor J. Abel, Royce Woodroffe, Toshio Moritani, Patricia Kirby, Matthew A. Howard, III, Hiroto Kawasaki, Mary Ann Werz

4:54–4:57 pm
324 Neurosurgical Cost Containment Via Improved Physician Awareness
Nitin Agarwal, Prateek Agarwal, Anna Mazurkiewicz, Daniel A. Wecht, Robert M. Friedlander

4:57–5:00 pm
325 Maintenance of Certification and the Aging Neurosurgeon
Maya A. Babu, Linda M. Liau, Robert J. Spinner, Fredric B. Meyer

5:00–5:03 pm
326 Cerebral Contusions: Catalysts and Counteractants
Joseph Carnevale, David J. Segar, Benjamin Drapcho, Cody Doberstein, John F. Morrison, Wael Asaad

5:03–5:06 pm
327 A Prospective Analysis of Hypovitaminosis D and Mortality in 400 Patients in the Neurocritical Care Setting
Jian Guan, Michael Karsy, Andrea Archambault Brock, Ilyas Eli, Holly Ledyard, Gregory W. J. Hawryluk, Min S. Park

5:06–5:09 pm
328 A Propensity-based Analysis of the Use of Prothrombin Complex Concentrate (PCC) Prior to Emergent Neurosurgical Procedures
Prateek Agarwal, Ashwin G. Ramayya, Kalil G. Abdullah, Nikhil Nayak, Timothy H. Lucas, II

5:09–5:12 pm
329 Efficacy and Safety of Riluzole in Acute Spinal Cord Injury (SCI). Rationale and Design of AOSpine Phase III Multi-center Double Blinded Randomized Controlled Trial. (RISCIS)
Michael G. Fehlings, Branko Kopjar, Robert G. Grossman

5:12–5:15 pm
330 Outcome of Percutaneous Versus Open Posterior Spinal Fixation in Thoracolumbar Fractures
Ahmed Mohamed Elsawaf

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RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 4

MODERATORS: Jennifer A. Moliterno Gunel, Nader Sanai

4:45–4:48 pm
331 Association Between Radiation Necrosis and Tumor Biology Following Stereotactic Radiosurgery for Brain Metastasis
Jacob A. Miller, Elizabeth Emily Bennett, Roy Xiao, Rupesh Kotecha, Samuel T. Chao, Michael A. Vogelbaum, Gene H. Barnett, Lilyana Angelov, Erin Murphy, Jennifer Yu, Manmeet Ahluwalia, John H. Suh, Alireza M. Mohammadi

4:48–4:51 pm
332 Molecular Characteristics of Tumor Infiltrating Front in Glioblastoma: Insights into Molecular Heterogeneity and Implications on Targeted Therapy
Arivazhagan Arimappamagan, B.S. Kruthika, Dawn B. Rose, Kondaiah Paturu, Vani Santosh

4:51–4:54 pm
333 Obtaining the Genetic Fingerprint of Resistance to Glioblastoma Through a Novel Multigenerational Xenograft Model
Arman Jahangiri, William Chen, Garima Yagnik, Michael De Lay, Jeffrey Wagner, Maxim Sidorov, Patrick Michael Flanigan, Manish Kumar Aghi

4:54–4:57 pm
334 A Functional Screen Identifies miRs that Induce Radioresistance in Glioblastomas
Clark C. Chen, Patryk Moskwa, Pascal O. Zinn, Brian R Hirshman, Young Eun Choi, Sachet A. Shukla, Wojciech Fendler, Jun Lu, Todd R. Golub, Anita Hjelmeland, Dipanjan Chowdhury

RAPID-EXCHANGE ORAL PRESENTATIONS

4:57–5:00 pm
335 A Modular, Multi-modality Integrative Pipeline for Neurosurgery Simulation and Visualization
Anthony Beardsworth Costa, Joshua B. Bederson

5:00–5:03 pm
336 Small RNA Sequencing of Glioblastoma Multiforme Extracellular Vesicles
Tristan de Mooij, Brandon A. McCutcheon, Alexey A Leontovich, Ian F. Parney

5:03–5:06 pm
337 Expansion of Dendritic Cells Using FLT3 Ligand to Treat Glioblastoma: A Preclinical Study
Tomas Garzon-Muvdi, Antonella Mangraviti, Debebe Theodros, Eileen Kim, Michael Jay Yellin, Henry Marsh, Michael Lim

5:06–5:09 pm
338 Molecular Mechanisms Underlying Malignant Progression of Low-grade IDH1 Mutant Meningiomas
Murat Gunel, Yale-Bonn-Cologne-MSKCC-Acibadem Brain Tumor Genetics Study Group

5:09–5:12 pm
339 Comparative Prognostic Value of the Cumulative Intracranial Tumor Volume (CITV) and Score Index for Radiosurgery (SIR) in Brain Metastasis
Brian R Hirshman, Bayard Wilson, Proudfoot A. James, Takao Koiso, Osamu Nagano, Bob S. Carter, Toru Serizawa, Masaaki Yamamoto, Clark C. Chen

5:12–5:15 pm
340 c-Met/ß1 Integrin: A Receptor Complex Driving Invasive Glioblastoma Resistance to Anti-angiogenic Therapy
Maxim Sidorov, Arman Jahangiri, Sung-Won Han, Michael De Lay, Jeffrey Wagner, Brandyn Castro, Patrick Michael Flanigan, Brandon S. Imber, William A. Weiss, Manish Kumar Aghi

RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 5
MODERATOR: John K. Ratliff

3:15–3:18 pm
341 Diabetes Mellitus and Back Pain: Markers of Diabetes Disease Progression are Associated with Chronic Back Pain
Lorenzo Rinaldo, Brandon A. McCutcheon, Hannah Gilder, Panagiotis Kerezoudis, Meghan Murphy, Patrick R. Maloney, Ahmed Hassoon, Mohamad Bydon

3:18–3:21 pm
342 Lumbar Total Disc Replacement by the Lateral Approach—Up to 10-year Follow-up
Luiz Pimenta, Luis Marchi, Rodrigo Augusto Amaral, Leonardo Oliveira, Joes Nogueira-Neto, Rubens Jensen, Etevaldo Coutinho

3:21–3:24 pm
343 Results of the 2015 SRS Survey on Single Versus Two Attending Surgeon Approach for Adult Spinal Deformity (ASD) Surgery
Justin K. Scheer, Lloyd Hey, Michael LaGrone, Michael Daubs, Christopher P. Ames

3:24–3:27 pm
344 Effects of Discontinuance of Preoperative Anti-platelet Medication in Multi-level Thoracolumbar Spine Surgery
Dong Wuk Son, Geun Sung Song

3:27–3:30 pm
345 Elective Anterior Cervical Discectomy and Fusion (ACDF) Versus Cervical Artificial Disc Replacement (C-ADR): A Comparison of Perioperative Morbidity and Early Outcomes
Pavan S. Upadhyayula, John K. Yue, Reid Hoshide, Erik Curtis, Joseph D. Ciacci

3:30–3:33 pm
346 Temporary Inferior Vena Cava Filter to Prevent Pulmonary Embolism in Thrombophillic Neurosurgery Patients
Scott A. Shapiro, Ian Kainoa White

3:33–3:36 pm
347 Clinical Outcomes Following Spinal Fusion Using an Intraoperative Computed Tomographic Three-dimensional Imaging System
Roy Xiao, Jacob A. Miller, Navin C. Sabharwal, Daniel Lubelski, Vincent J. Alentado, Andrew Torre Healy, Thomas Mroz, Edward C. Benzel

3:36–3:39 pm
348 Pain Control by Coaptation Procedure C3 and C4 Anterior Rami to Brachial Plexus
Shokei Yamada, Russell R. Lonser, Daniel J. Won, Bryan E. Tsao

3:39–3:42 pm
349 Safety of the Sitting Cervical Position for Elective Spine Surgery
Stephen Sandwell, Kristopher T. Kimmell, Howard J. Silberstein, Thomas G. Rodenhouse, Paul K. Maurer, Webster H. Pilcher, Kevin A. Walter

3:42–3:45 pm
350 Mini-open Transpedicular Corpectomy and Percutaneous Instrumentation Without Fusion: Reoperation Rates for Implant Failure and Pseudarthrosis
Darryl Lau, Dean Chou

RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 6
MODERATORS: Andrew F. Ducruet, Meysam Ali Kebriaei

3:15–3:18 pm
351 Do Rehabilitation Therapies Affect Patient Outcomes After Chiari I Decompression Surgery?
Grace M. Deyo, Danielle N. Ryan, Stephen P. Sales, Lance S. Governale

3:18–3:21 pm
352 Robot-assisted Endoscopic Third Ventriculostomy
Reid Hoshide, Mark Calayag, Hal S. Meltzer, Michael L. Levy, David D. Gonda

3:21–3:24 pm
353 High Intensity Ultrasound for the Treatment of Vincristine Induced Neuropathic Pain
Youngwon Youn, Ian Thomas Walling, Lucy Gee, Paul Neubauer, Lance Frith, Emery Williams, Clif Burdette, Julie G. Pilitsis

3:24–3:27 pm
354 Diagnostic Utility of Cerebral Biopsy Following Suggestive Cerebral Angiogram in the Workup of CNS Vasculitis
James Monroe Wright, III, Berje Haroutuon Shammassian, Jeffrey Tait Nelson, Christina Huang Wright

3:27–3:30 pm
355 Endovascular Management of Cervical Carotid and Vertebral Artery Dissection: Indications, Techniques, and Outcomes from a 20-year Experience
Karam Moon, Felipe Albuquerque, Tyler Scott Cole, Bradley A. Gross, Cameron G. McDougall

3:30–3:33 pm
356 Microsurgical Anatomy of the Brainstem Safe Entry Zones: A Cadaveric Study with High-resolution Magnetic Resonance Imaging and Fiber Tracking
Debraj Mukherjee, Veysel Antar, Bora Gurer, Ulas Cikla, Gabriel Neves, Mehmet Ekici, Tomer Hananya, Aaron S. Field, Shahriar M. Salamat, Mustafa Kemal Baskaya

3:33–3:36 pm
357 Gamma Knife Stereotactic Radiosurgery in the Management of Large Cerebral AVMs
Manmohan Singh, Deepak Aggarwal, Shashank Sharad Kale

3:36–3:39 pm
358 Adoption of a "Radial First" Approach for Diagnostic Cerebral Angiography: A Feasibility Study
Samir Sur, Brian Michael Snelling, Dileep Yavagal, Eric C. Peterson

3:39–3:42 pm
359 Delayed Treatment of Ruptured AVMs: Is It Ok to Wait?
Jeffrey S. Beecher, Awais Vance, Kristopher Allen Lyon, Vin Shen Ban, Cameron Michael McDougall, Louis A. Whitworth, Jonathan A. White, Duke S. Samson, H. Hunt Batjer, Babu Guai Welch

3:42–3:45 pm
360 Relationship of A1 Segment Hypoplasia to Anterior Communicating Artery Aneurysm Morphology and Risk Factors for Rupture
Lorenzo Rinaldo, Brandon A. McCutcheon, Meghan Murphy, Mohamad Bydon, Alejandro A. Rabinstein, Giuseppe Lanzino

RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 7
MODERATORS: Orin Bloch, Jason Heth

3:15–3:18 pm
361 A Comparison of Prognostic Indices in Melanoma Brain Metastases Patients Who Undergo Stereotactic Radiosurgery
Hideyuki Kano, Alejandro Morales-Restrepo, Berkcan Akpinar, Aditya K. Iyer, Gregory Weiner, John Flickinger, L. Dade Lunsford

3:18–3:21 pm
362 Priming of the Brain Tumor Microenvironment Enables Improved Nanomedicine Delivery
Yuanxin Chen, Wen Jiang, Yaqing Qie, Xiujie Liu, Christina von Roemeling, Kevin Shih, Robert E. Wharen, Betty Y.S. Kim

3:21–3:24 pm
363 Cortical Plasticity of Motor-eloquent Areas Measured by Navigated Transcranial Magnetic Stimulation in Glioma Patients
Neal Conway, Noriko Tanigawa, Bernhard Meyer, Sandro M. Krieg

3:24–3:27 pm
364 Creation of a Dual-labeled Cancer-targeting Alkylphosphocholine Analog for Dual Modality Quantitative PET and Intraoperative Tumor Visualization
John S. Kuo, Ray R. Zhang, Anatoly N. Pinchuk, Justin Jeffrey, Paul A. Clark, Jamey P. Weichert

3:27–3:30 pm
365 Epigenetic Profiling Reveals a Unique Histone Code in Chordoma
Nelson Moussazadeh, Samuel H. Berman, Ilya Laufer, Mrinal Gounder, Yupeng Zheng, Joshua Sommer, Mark H. Bilsky, Neil L. Kelleher, Cameron Brennan

3:30–3:33 pm
366 Predictive Factors for Survival in Surgical Series of Symptomatic Metastatic Epidural Spinal Cord Compression: A Prospective North American Multi-Centre Study in 142 Patients
Michael G. Fehlings, Anick Nater

3:33–3:36 pm
367 Autocrine/Paracrine Erythropoietin Signaling Associated with Symptomatic von Hippel-Lindau Hemangioblastomas
Saman Sizdahkhani, Xiang Wang, Nancy A. Edwards, Zhengping Zhuang, Russell R. Lonser, Edward H. Oldfield, Prashant Chittiboina

3:36–3:39 pm
368 Anatomy and White Matter Connections of the Orbitofrontal Gyrus
Joshua Dee Burks, Phillip A. Bonney, Andrew K.P. Conner, Chad A. Glenn, Robert G. Briggs Lillian B. Boettcher, Daniel L. O'Donoghue, Dee H. Wu, Michael Edward Sughrue

3:39–3:42 pm
369 CARs Deficient in Lck Signaling Require 4-1BB Costimulation to Expand in Vivo, Resist Regulatory T-cell Suppression, and Treat Solid Tumors in Immune-intact Hosts
Carter M. Suryadevara, Rupen Desai, Samuel Harrison Farber, Patrick C. Gedeon, Adam Swartz, David Snyder, James Herndon, Patrick Healy, Bryan D. Choi, Peter Edward Fecci, Luis Sanchez-Perez, John H. Sampson

3:42–3:45 pm
370 MR-guided Focused Ultrasound Delivery of Polymeric Brain-penetrating Nanoparticle MicroRNA Conjugates in Glioblastoma
Rafael A. Vega, Ying Zhang, Colleen Curley, Richard L. Price, Roger Abounader

RAPID EXCHANGE ORAL PRESENTATIONS

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RAPID-EXCHANGE ORAL PRESENTATIONS SESSION 8
MODERATORS: Gregory W.J. Hawryluk, Alan S. Hoffer, Nader Pouratian

3:15–3:18 pm
371 How Does Case Type, Length of Stay, and Comorbidities Affect Medicare DRG Reimbursement for Minimally Invasive Surgery (MIS) for Deformity?
Pierce D. Nunley, Richard G. Fessler, Paul Park, Joseph M Zavatsky, Gregory M. Mundis, Jr., Juan S. Uribe, Robert Eastlack, Stacie Nguyen, Dean Chou, Michael Y. Wang, Neel Anand, Adam S. Kanter, Christopher I. Shaffrey, Praveen V. Mummaneni, International Spine Study Group

3:18–3:21 pm
372 Profound Lack Non-clinical Healthcare Aptitude Across a Range of Healthcare Providers and Students
Gary R. Simonds

3:21–3:24 pm
373 Is SEEG safe? A Systematic Review and Meta-Analysis of Stereo-electroencephalography Related Complications
Jeffrey Paul Mullin, Michael Shriver, Soha Abdu Alomar, Imad Najm, Jorge Alvaro Gonzalez-Martinez

3:24–3:27 pm
374 Modeling the Effects of Current Steering with Directional Leads
Tushar Krishnan, Richard Mustakos, G. Karl Steinke

3:27–3:30 pm
375 DIRECT DBS: A Prospective, Multi-center Clinical Trial with Blinding for a Directional DBS Lead
Jens Volkmann, Stephan Chabardes, G. Karl Steinke, Stephen Carcieri

3:30–3:33 pm
376 The Salt Versus Sugar Debate: Urinary Sodium Losses Following Hypertonic Saline Administration Curtails its Superior Osmolar Effect in Comparision to Mannitol in Severe Traumatic Brain Injury
Aniruddha Tekkatte Jagannatha, Sriganesh Kamath, Indira Devi, Umamaheswara G.S. Rao

3:33–3:36 pm
377 Craniectomy Versus Craniotomy in Traumatic Brain Injury: A Propensity-matched Analysis of Long-term Functional and Quality of Life Outcomes
Michael L. Kelly, Berje Haroutuon Shammassian, Mary Joan Roach, Charles Thomas, Amy K. Wagner

3:36–3:39 pm
378 Monoclonal Antibody Targeting Connexion 43 Hemichannel Improves Functional Recovery and Reduces Secondary Injury After Traumatic Spinal Cord Injury
Asif Maknojia, Shane M. Sprague, Manuel Riquelme, Sumin Gu, Pamela Reed, Viktor Bartanusz, Jean Jiang, Naomi Sayre

3:39–3:42 pm
379 Communicating a Traumatic Brain Injury Patient's Potential Need for Operative Intervention: The Surgical Intervention for Traumatic Injury Scale
Eric Anthony Sribnick, Junxin Shi, Michael P. Lunney, Sanjay S. Dhall, Jason W. Allen, David W. Wright, Krista Wheeler, Huiyun Xiang

3:42–3:45 pm
380 Effects and Clinical Characteristics of Intracranial Pressure Monitoring-targeted Management for Subsets of Traumatic Brain Injury: An Observational Multicenter Study
Qiang Yuan, Xing Wu, Jin Hu, Jian Yu, Yirui Sun, Zhiqi Li, Zhuoying Du, Ying Mao, Liangfu Zhou

Continuing Medical Education

Congress of Neurological Surgeons 2016 Annual Meeting Objectives

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

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

At the conclusion of the 2016 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 and models. Hands-on Practical Courses provide an opportunity to improve surgical skills by applying and demonstrating learned techniques. Practical Courses also provide an opportunity to review case-based complex issues and discuss potential solutions.

- Practical Courses are offered Saturday, September 24, and Sunday, September 25.

General Scientific Sessions, Section Sessions, Clinical Controversy Sessions, Guideline Sessions, *Operative Neurosurgery* Sessions, Luncheon Seminars, and Dinner Seminars

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

- General Scientific Sessions, Section Sessions, Clinical Controversy Sessions, Guideline Sessions, and *Operative Neurosurgery* Sessions are offered Sunday, September 25, through Wednesday, September 28.
- Luncheon Seminars are offered Monday, September 26, through Wednesday, September 28.
- Dinner Seminars are offered on Saturday, September 24; Monday, September 26; and Tuesday, September 27.

Case-based Education

Challenging neurosurgical cases will be reviewed and discussed in a variety of innovative formats including Live Surgery via Telemedicine and Panel Discussions.

- Live Surgery via Telemedicine in the Exhibit Hall will take place Monday, September 26, through Wednesday, September 28. CME is not offered for these sessions.

Original Science Program

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

- Oral Presentations by subspecialty and CNS Poster viewing will take place on Monday, September 26, and Tuesday, September 27.
- Rapid-exchange Presentations by subspecialty will take place on Tuesday, September 27, and Wednesday, September 28.
- Late Breaking Abstracts will be presented on Wednesday, September 28.

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 46.75 *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: 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 or Symposium, 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. Attendees will receive a maximum of six-and-a-half (6.5) *AMA PRA Category 1 Credits*™ for the Saturday Symposium, and a maximum of seven (7) *AMA PRA Category 1 Credits*™ for the Sunday Symposium. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Luncheon Seminars
Attendees will receive a maximum of one-and-a-half (1.5) *AMA PRA Category 1 Credits*™ for all eligible Luncheon Seminars. Physicians should 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 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 San Diego, 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

Active Duty Military Member Benefits

Complimentary registration and limited free housing is available to US Active CNS members who are Active Duty Military. Free housing is limited to the first 10 Active Duty Military CNS members registered for the Annual Meeting.

CNS Members may take advantage of these benefits in the following way: When registering for the CNS Annual Meeting, please select Active Duty Military member on the online registration form at **cns.org/2016**. If you are one of the first 10 Active Duty Military registrants, you will be contacted by the CNS staff to confirm housing arrangements. Non-members should contact **membership@cns.org** to join the CNS and confirm that you qualify for these benefits. CNS membership is complimentary to Active Duty Military neurosurgeons.

Airport

The CNS Annual Meeting hotels and the San Diego Convention Center are located approximately four miles from the San Diego International Airport (SAN).

Taxis are readily available at the Transportation Plazas in front of Terminal 1 and 2 at the San Diego 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 Scootaround at 1-888-441-7575. Scootaround 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 2016 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 San Diego restaurants require coats and ties for gentlemen. Please check each restaurant's policy when making reservations.

Spouse Hospitality Suite

All registered CNS Annual Meeting spouses and guests are invited to visit the CNS Spouse Hospitality Suite at the Marriott Marquis San Diego Marina, 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.

Children

Children over the age of 12 should register at the guest registration fee. (Please note that children under the age of 18 are not allowed in the Exhibit Hall.)

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

Climate

September temperatures in San Diego average a high of 75°F and a low of 64°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 2016 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, September 26	9:00 am–3:00 pm
Tuesday, September 27	9:00 am–3:00 pm
Wednesday, September 28	9:00 am–2:15 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

2017	Boston, Massachusetts, October 7–11
2018	Houston, Texas, October 6-10
2019	San Francisco, CA, October 19-23

Hotel Information

See pages 69–71.

Registration Information

Items included in registration fee:

- One ticket to the Opening Reception on Sunday, September 25
- Admission to General Scientific Sessions, Sunday through Wednesday
- Original Science Program to include Oral Presentations, Rapid-exchange Oral Presentations, Section Poster Viewing Sessions, and Digital Posters.
- Live Surgeries
- Clinical Controversies, Guidelines, *Operative Neurosurgery*, and Clinical Trial Update Sessions
- Section Sessions
- Exhibit Hall Access, Monday through Wednesday

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/press or by calling 1-847-805-4493. Once onsite, media are required to check in at the CNS registration area and then proceed to the Press Room to pick up their press badges.

Registration Information and Hours:

Saturday, September 24	7:00 am–5:30 pm
Sunday, September 25	7:00 am–7:00 pm
Monday, September 26	6:30 am–6:30 pm
Tuesday, September 27	6:30 am–6:30 pm
Wednesday, September 28	6:30 am–3:30 pm

Shuttle Services

Shuttle service to the San Diego Convention Center will be available beginning Saturday, September 24, from select CNS Hotels as indicated in Hotel Information on pages 70–71. A shuttle schedule will be posted at the hotels and convention center.

Smoking

The San Diego Convention Center and official CNS hotels are non-smoking facilities.

Speaker Ready Room

All speakers and abstract oral presenters should visit the Speaker Ready Room at the San Diego Convention Center prior to their presentations.

Saturday, September 24	7:00 am–4:30 pm
Sunday, September 25	7:00 am–6:00 pm
Monday, September 26	6:30 am–3:45 pm
Tuesday, September 27	6:30 am–3:45 pm
Wednesday, September 28	6:30 am–2:00 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 by the CNS throughout the San Diego Convention Center (with the exception of the Exhibit Hall) and the Marriott Marquis San Diego Marina 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/2016

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

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 San Diego Convention Center.

REGISTRATION RATES	ADVANCE REGISTRATION	AFTER AUGUST 25, 2016
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.

* All non-member **residents** must have their Program Director sign registration form. If registering online, a letter from your Program Director certifying that you are a resident in a neurosurgical training program 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.

*** Associate category includes physicians and/or scientists who are not neurological surgeons but have shown distinction in a neurosurgically related discipline.

† 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

August 25 — Advance registration discount and housing deadline

September 1 — Last day to cancel registration in order to receive a full refund, less a $100 processing fee

September 11 — 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 12 — Any hotel changes or cancellations must be made directly with the hotel after September 12. 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 1, 2016. Course, seminar, and event tickets will be refunded in full until September 1, 2016. No refunds of any kind will be given after this date, regardless of cause. Refunds will not be given for no-shows.

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/2016 to make your reservation today! Be sure to complete the entire housing section on the reservation form.

Hotel Reservation Deadlines

Reserve your room by August 25, 2016. (Rooms are subject to availability.)

Deposit

A deposit of one night's room and tax is due at the time your hotel reservation is made. This payment must be submitted with your registration fee and 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 11. The hotel requires a deposit of one night's room and tax to reserve your room. Please make any changes or cancellations through the CNS housing bureau, Wyndham Jade, through September 11. Beginning September 12 and up to 72 hours prior to your arrival, changes and cancellations must be made directly with your reserved hotel.

Beginning September 12, 2016

- 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 to a limited number of CNS Resident members on a first-come, first-served basis.

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

- Complete and submit the CNS Resident member housing application by July 1, 2016. Completed applications may be submitted by 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 CNS 2016 Annual Meeting by July 1, 2016.
- All residents enrolled in ACGME approved programs have been automatically given complimentary CNS Resident membership.
- If you are not a CNS Resident member, complete your application by May 31, 2016.

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/2016/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)	Single/Double (Excludes local/ state tax and fees*)	Single/Double (Includes local/ state tax and fees*)
Marriott Marquis San Diego Marina—Headquarter Hotel (City View)	$306	$344.25 **
Marriott Marquis San Diego Marina—Headquarter Hotel (Bay View)	$326	$366.75 **
Embassy Suites San Diego Downtown	$285	$321.34
Hard Rock Hotel San Diego	$259	$291.38 **
Hilton San Diego Gaslamp Quarter	$279	$314.43
Omni San Diego Hotel	$279	$315.49
The US Grant Hotel San Diego	$259	$292.07
The Westin San Diego Gaslamp Quarter	$249	$280.80

** Local taxes and fees subject to change.*

*** An additional daily CA Tourism Fee ranging from $0.44–$0.77 per room night will be charged on site by the hotel and is not included in the 1st night's room and tax deposit.*

Hotel Information

MARRIOTT MARQUIS SAN DIEGO MARINA
HEADQUARTERS HOTEL

333 West Harbor Drive, San Diego, CA 92101
Next to San Diego Convention Center

Headquarters hotel is adjacent to the convention center. Shuttle service only provided to and from dinner seminars and social events as applicable.

Amenities Include:
- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- Coffee/tea in room
- Two outdoor pools
- Full service spa
- Business center
- On-site restaurants
- Valet dry cleaning
- Cash and carry food available 24 hours

HARD ROCK SAN DIEGO HOTEL

207 5th Ave. San Diego, CA 92101
0.1 miles to San Diego Convention Center

Due to hotel proximity, shuttle service is not provided

Amenities Include:
- On-site restaurants
- Full service spa
- Room service
- Valet service
- All-access pass, $23 per day value (complimentary to CNS guests)
  Pass includes:
  - High-speed Internet
  - Fitness center
  - Bike rental
  - Business center
  - And more

EMBASSY SUITES SAN DIEGO BAY DOWNTOWN

601 Pacific Highway, San Diego, CA 92101
0.8 miles to San Diego Convention Center

Complimentary shuttle service provided starting Saturday, September 24, 2016

Amenities Include:
- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- Complimentary breakfast
- Complimentary evening reception w/light appetizers
- All suites property
- Business center
- Pool
- Laundry/valet service
- Room service

HILTON SAN DIEGO GASLAMP QUARTER

401 K Street, San Diego, CA 92101
0.2 miles to San Diego Convention Center

Due to hotel proximity, shuttle service is not provided

Amenities Include:
- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- Pool
- Business center
- Laundry/valet service
- Room service

OMNI SAN DIEGO HOTEL

675 L Street, San Diego, CA 92101
0.2 miles to San Diego Convention Center

Due to hotel proximity, shuttle service is not provided

Amenities Include:

- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- Spa services
- Pool
- Business center
- On-site restaurant
- Laundry/dry cleaning service
- Childcare services
- Room service
- Pet friendly

THE US GRANT

326 Broadway, San Diego, CA 92101
0.9 miles to the San Diego Convention Center

Complimentary shuttle service provided starting Saturday, September 24, 2016

Amenities Include:

- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- Business center
- On-site restaurant
- On-site fine art gallery
- Pet friendly
- Room service

WESTIN SAN DIEGO GASLAMP QUARTER

910 Broadway Circle, San Diego, CA 92101
1.2 miles to the San Diego Convention Center

Complimentary shuttle service provided starting Saturday, September 24, 2016

Amenities Include:

- High-speed Internet (complimentary to CNS guests)
- Fitness center (complimentary to CNS guests)
- One-cup coffee maker in room
- Business center
- Room service
- Childcare services
- Pet friendly

2016 CNS Annual Meeting

San Diego Convention Center

HOTELS

1 Marriott Marquis San Diego Marina
2 Omni San Diego Hotel
3 Embassy Suites San Diego Bay – Downtown
4 Hilton San Diego Gaslamp Quarter
5 Hard Rock Hotel San Diego
6 The US GRANT – A Luxury Collection Hotel
7 The Westin San Diego Gaslamp Quarter

VISITSANDIEGO.COM SAN DIEGO convention center

2016 Exhibitors

7D Surgical
Accuray
Ad-Tech Medical Instrument Corp.
AIS PainCare
Alevio
Alpha Omega Co. USA
Alphatec Spine, Inc.
American Association of Neurological Surgeons
Anatom-e
Anatomage
Apex Medical, Inc.
Arbor Pharmaceuticals, Inc.
Arbor Pharmaceuticals, Inc.
Arkis BioSciences
Baylor Scott & White Health
Bien-Air Surgery
BiO2 Medical
BioD, LLC
Boss Instruments
Boston Scientific
Brain Aneurysm Foundation
Carl Zeiss Meditec, Inc.
CMF Medicon Surgical Inc.
Codman Neuro DePuy Synthes
Collagen Matrix, Inc.
CompHealth
CoreLink
Cosman Medical
Designs For Vision, Inc.
DJO Global, Inc.
Edge Therapeutics
Electrical Geodesics, Inc. (EGI)
Electro Lube (Eagle Surgical Products, LLC)
ELEKTA, Inc.
elliquence
Elsevier, Inc.
Fehling Surgical
Gauthier
Haag-Streit USA
Hayes Locums
Hemedex, Inc.
Hitachi Aloka Medical America, Inc.
Hospital Corporation of America
HyperBranch Medical Technology, Inc.
IMRIS – Deerfield Imaging
Inion Inc.
Integra
IntraNerve
Journal of Neurosurgery
K2M, Inc.
Kaiser Permanente – SCPMG
Karl Storz Endoscopy / Karl Storz Endoscopy – America, Inc.
Kinamed, Inc.
Kirwan Surgical Products
KLS Martin
Kogent Surgical
Koros USA, Inc.
LDR Spine
Leica Microsystems
Life Instrument Corp
LivaNova
M Dialysis Inc
Mayo Clinic
Mazor Robotics
Medtech Surgical
Medtronic
MicroVention
Mizuho America, Inc.
Monteris Medical
MRI Interventions
Munson Healthcare
Nadia International Inc
NeuroPoint Alliance
Neurosurgery Research and Education Foundation
Nexstim, Inc.
NICO Corporation
North American Neuromodulation Society (NANS)
North American Spine Society
NovaBone Products LLC
Novocure, Inc.
NuTech
Orascoptic
OssDsign AB
OsteoMed
Paradigm Spine, LLC
Penumbra, Inc.
Peter Lazic US Inc.
Pfizer
PMT Corporation
Portola Pharmaceuticals, Inc.
pro med instruments, Inc.
Renishaw, Inc.
Rose Micro Solutions
RosmanSearch
RTI Surgical
Samsung
Sawbones
Scanlan International, Inc.
SeaSpine
SheerVision
Shukla Medical
SI-BONE
Siemens Healthcare
Sophysa USA
Soring, Inc
SpecialtyCare
Spinal Simplicity
Spine Surgery Today & Healio.com by SLACK, Inc.
Spine Wave
Spineology
St. Jude Medical
Stryker
Surgical Theater
SurgiTel
Synaptive Medical
TeDan Surgical Innovations
Thieme Medical Publishers
ThinkFirst National Injury Prevention Foundation
Thompson Surgical Instruments
TMG Coins
UF Health Neuromedicine
United Biologics, Inc.
Vertex Pharmaceuticals
Wolters Kluwer
X-spine Systems
Xenco Medical
Xodus Medical, Inc.
Zimmer Biomet
Zyga Technology, Inc.

as of 4/15/16