

PRELIMINARY PROGRAM



CNS

MISSION:

NEUROSURGERY

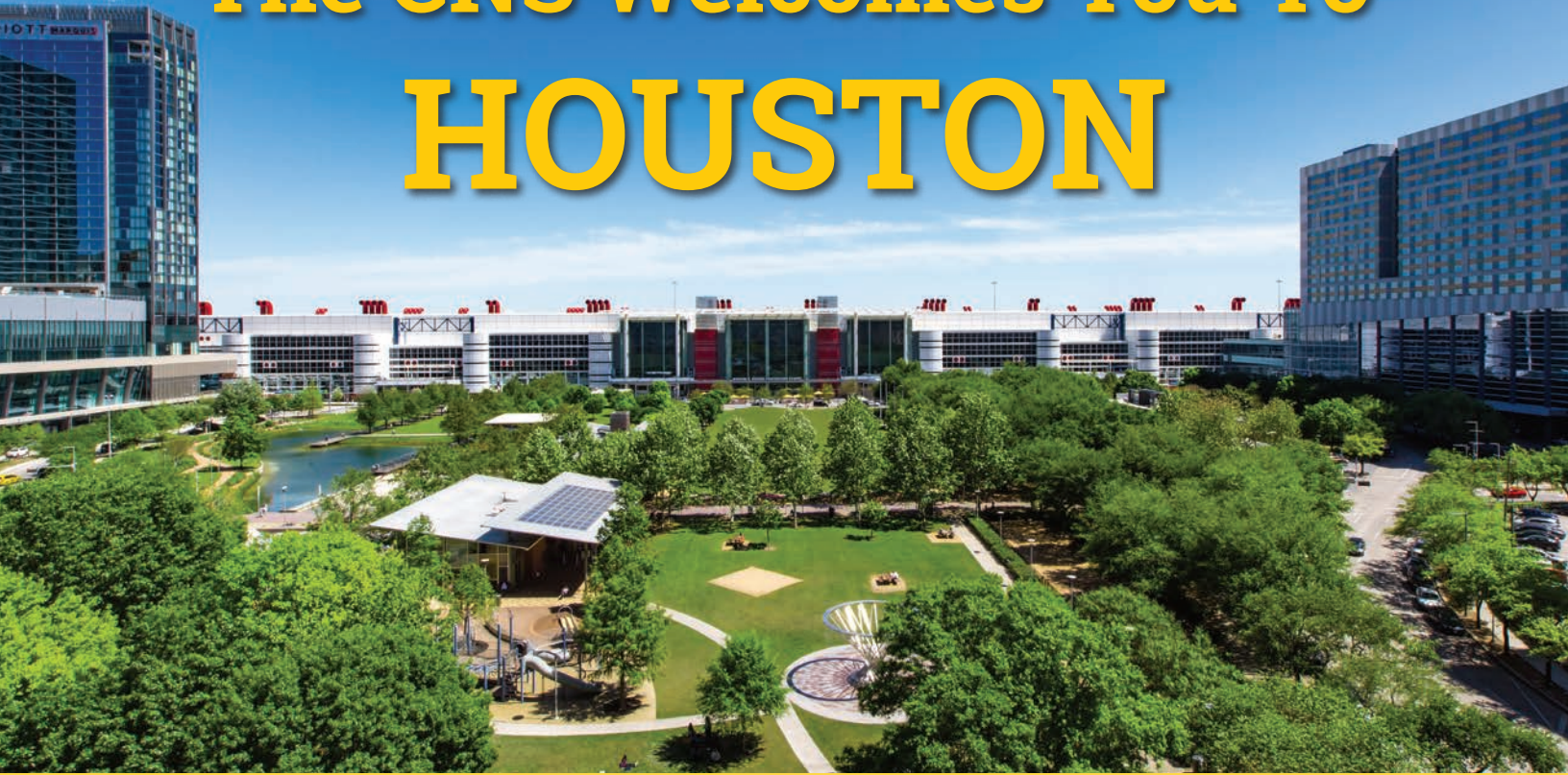
CONGRESS OF NEUROLOGICAL SURGEONS

2018 ANNUAL MEETING

HOUSTON, TEXAS | OCTOBER 6-10, 2018

Advance Registration Deadline: September 6, 2018

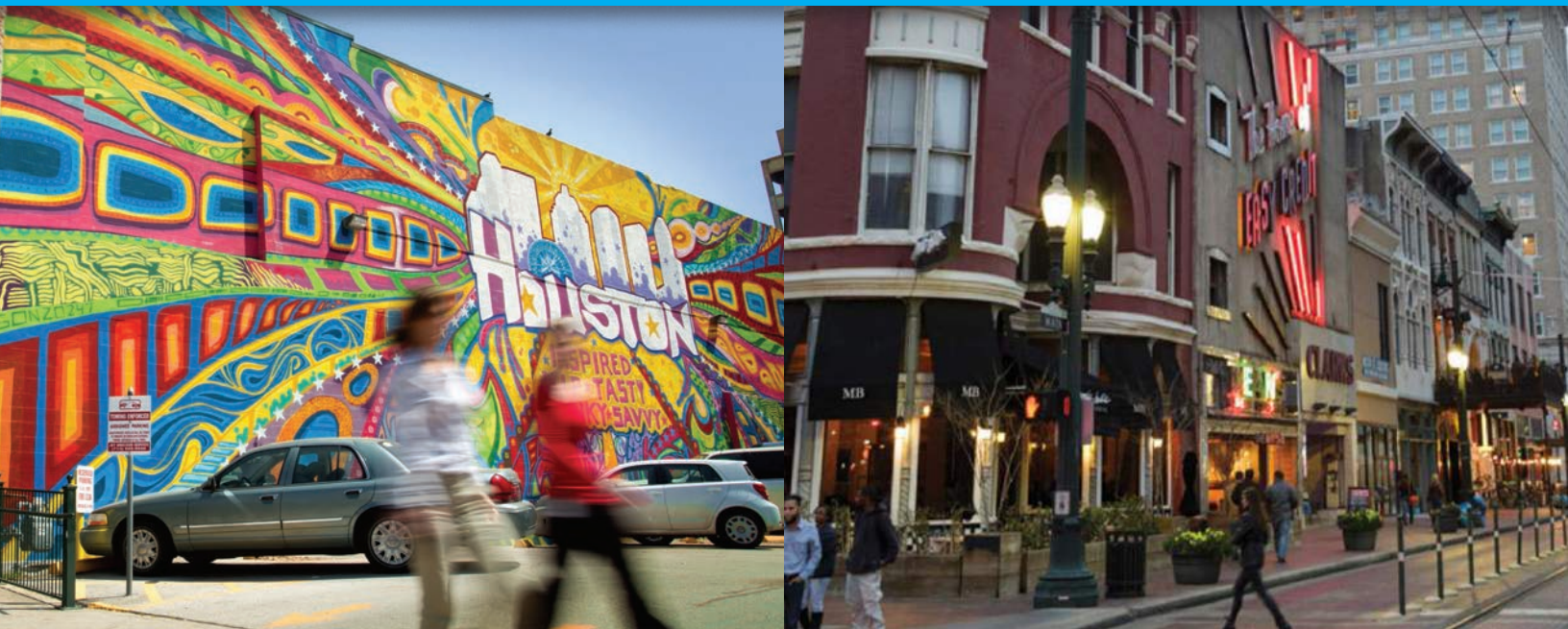
The CNS Welcomes You To HOUSTON



Avenida Houston and the George L. Brown Convention Center (pictured above) are nestled in the heart of a bustling metropolis that offers robust international influences, a slew of inspired restaurants, and a vibrant arts scene.

"Famous Texas hospitality makes for a fun-filled visit, but Houston is also full of surprises."

-London Evening Standard, 2017





"WE CHOOSE TO GO TO THE MOON ... NOT BECAUSE IT'S EASY, BUT BECAUSE IT IS HARD."

When President John F. Kennedy made this declaration in 1962, he was presenting something that seemed impossible: to put a human being on the moon. This historic speech entered the United States into the Space Race that ultimately saw advances in science and technology beyond imagination in the early 1960s.

The 2018 CNS Annual Meeting's arrival in Houston, Texas, is an excellent time to take stock of why we do what we do. Neurosurgery, like manned space travel, was utterly unattainable for the great vast majority of human history. Our predecessors didn't begin to explore the brain and develop innovative engineering because it was easy, but because it was hard. Mission: Neurosurgery reminds us that we would not be where we are without insightful scientific study, the determination of the medical community, and dedicated teams around us.

Neurosurgery professionals join together at the CNS Annual Meeting year in and year out for many reasons: furthering our education, examining the most cutting edge in our industry's technology that we may one day use in our own practices, and enjoying the company and wisdom of our peers. But I would encourage attendees to also use this week as an opportunity to refocus and re-energize ourselves, as well as commemorate what we have achieved.

This Preliminary Program will be your guide to getting the most out of your week at the CNS Annual Meeting. We have brought in speakers from fields as diverse as race car driving, big-wave surfing, and extreme bionics. We're thrilled to introduce an all-day Robotics Symposium, and will discuss state-of-the art in brain-machine interface during General Scientific Session 1 on Sunday. The latest in Big Data is explored in a practical course and dinner seminar. Be sure to visit the CNS Xperience Lounge to get hands-on with the latest in technology, meet and greet with special speakers, or experience live surgery in the Presentation Theater. Mornings are dedicated to guidelines updates and late-breaking abstracts, while afternoons bring the newest in original science during section sessions, and interactive debates in multiple case-based discussion sessions.

We'll also celebrate some of the best work of the last year by highlighting the best papers published in *Neurosurgery* and honoring the top innovations in neurological surgery. We hope that you leave this meeting inspired by what we have done and what we will soon be able to do in our field.

On behalf of the Congress of Neurological Surgeons Executive Committee, the Scientific Program Committee, and the 2018 Honored Guest Robert H. Rosenwasser, MD, I warmly welcome you to attend this year's CNS Annual Meeting in Houston, Texas, October 6-10.

Sincerely,
Ashwini D. Sharan, MD
CNS President



The purpose of the 2018 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, psychiatrists, and infectious disease specialists are welcome and encouraged to attend the 2018 CNS Annual Meeting.

1 President's Message	63 Abstracts / Oral Presentations, Sunrise Science and Late-breaking Abstract Sessions
2 Annual Meeting At-a-Glance	74 Continuing Medical Education
4 Honored Guest	76 General Information
5 Featured Speakers	78 Registration Information
10 Annual Meeting Leadership	79 Hotel Information
13 Annual Meeting Committee	82 Exhibitors
16 Subspecialty Session Highlights	
Scientific Program	
26 Saturday	
32 Sunday	
38 Monday	
49 Tuesday	
59 Wednesday	



We welcome the Brazilian Society of Neurosurgery, our international partner for the 2018 CNS Annual Meeting.

SATURDAY, OCTOBER 6

8:00 am–5:00 pm	Symposia 1: 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–PC09)
12:30–4:00 pm	Afternoon Practical Courses (PC10–PC15)
5:00–6:30 pm	International Reception
6:30–8:30 pm	Dinner Seminar (DIN1): The Bottom Line in a Changing World—Updates about CPT, ICD-10, MIPS, and Bundling

SUNDAY, OCTOBER 7

8:00 am–4:00 pm	Symposia 2: Surgical Robotics—Engineering to Bedside
8:00 am–4:00 pm	Full Day Practical Course (PC16)
8:00–11:30 am	Morning Practical Courses (PC17–PC25)
12:30–4:00 pm	Afternoon Practical Courses (PC26–PC27)
1:00–3:00 pm	CNS Resident SANS Challenge Preliminary Rounds
4:30–6:30 pm	General Scientific Session I: Technology as a Means of Enhancing Human Performance Marriott Marquis Houston
6:30–8:30 pm	CNS Opening Reception Marriott Marquis Houston

MONDAY, OCTOBER 8

7:00–8:30 am	Guidelines for Acute Cervical and Thoracolumbar Spine Trauma
7:00–8:30 am	Sunrise Session and Late-breaking Abstracts Session
8:45–9:45 am	General Scientific Session II: Neurosurgeon as Hero
9:30 am–4:00 pm	Exhibit Hall Open
9:45–10:45 am	Beverage Break in the Exhibit Hall
10:00–10:30 am	Live Surgery in the Exhibit Hall
10:45 am–12:15 pm	General Scientific Session II, continued
12:15–1:45 pm	Luncheon Seminars (M01–M11)
12:15–1:45 pm	Industry Sponsored Lunch Symposia
1:45–2:45 pm	Beverage Break in the Exhibit Hall
2:45–4:15 pm	Section Sessions and Oral Presentations
4:15–6:15 pm	Case-based Discussion Sessions
7:30–9:30 pm	Dinner Seminar (DIN2): Advances and Controversies in Intracranial AVM Management Dinner Seminar (DIN3): Robotics and Spinal Surgery—The Future is Now

TUESDAY, OCTOBER 9

7:00–8:30 am	Cerebrovascular Guidelines: Aneurysms, Arteriovenous Malformations, and Acute Ischemic Stroke
7:00–8:30 am	Sunrise Session and Late-breaking Abstracts Session
8:45–9:45 am	General Scientific Session III: Systems and Teams as a Means to Extend Human Performance
9:30 am–3:00 pm	Exhibit Hall open
9:45–10:45 am	Beverage Break in the Exhibit Hall
10:00–10:30 am	Live Surgery in the Exhibit Hall
10:45 am–12:15 pm	General Scientific Session III, continued
12:15–1:45 pm	Luncheon Seminars (T12–T22)
12:15–1:45 pm	Industry Sponsored Lunch Symposia
1:45–2:45 pm	CNS Resident SANS Challenge Championship Round
1:45–2:45 pm	Beverage Break in the Exhibit Hall
2:00–2:45 pm	Annual Business Meeting
2:45–4:15 pm	Section Sessions and Oral Presentations
4:15–6:15 pm	Case-based Discussion Sessions
6:15–7:15 pm	Resident Recruitment Social
7:30–9:30 pm	Dinner Seminar (DIN4): Emerging Indications for Functional Neurosurgery: Tourette, OCD, Depression, and Pain

WEDNESDAY, OCTOBER 10

7:00–8:30 am	Guidelines on Skull Base Update
7:00–8:30 am	Sunrise Session and Late-breaking Abstracts Session
8:45–9:45 am	General Scientific Session IV: Neurosurgery Future State
9:30 am–2:00 pm	Exhibit Hall Open
9:45–10:45 am	Beverage Break in the Exhibit Hall
10:00–10:30 am	Live Surgery in the Exhibit Hall
10:45 am–12:15 pm	General Scientific Session IV, continued
12:15–1:45 pm	Luncheon Seminars (W23–W31)
12:15–1:45 pm	Industry Sponsored Lunch Symposia



#2018CNS

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

HONORED GUEST

Robert H. Rosenwasser, MD, MBA, FACS, FAHA

President, Vicki and Jack Farber Institute for Neuroscience at Jefferson, Jewell L. Osterholm, MD Professor and Chair of Neurological Surgery, Professor of Radiology, Thomas Jefferson University, Philadelphia, Pennsylvania



Robert H. Rosenwasser attended Louisiana State University in New Orleans, Louisiana, and graduated in 1975 with a BS/BA degree from Nicholls State University in Thibodaux, Louisiana. He received his MD from Louisiana State University in Shreveport in 1979. Dr. Rosenwasser completed a general surgery internship and residency in neurological surgery at Temple University Hospital in Philadelphia. In 1984 he was a fellow in neurovascular surgery under Drs. Drake and Peerless at University of Western Ontario in London, Ontario. From 1992 to 1993, he completed a fellowship in interventional neuroradiology under Dr. Alex Berenstein at New York University. Dr. Rosenwasser recently completed his MBA at Villanova University.

In 1994, Dr. Rosenwasser became professor of neurosurgery at Thomas Jefferson University and director of interventional neuroradiology at the Jefferson Hospital for Neuroscience. He also served as division chief of cerebrovascular surgery and interventional neuroradiology at Thomas Jefferson University Hospital. In 2004, he was appointed chair of the Department of Neurological Surgery. He is also a fellow of the American Heart Association.

Dr. Rosenwasser is a member of the Congress of Neurological Surgeons, the American Association of Neurological Surgeons, the American Academy of Neurological Surgery, and the American College of Surgeons. He is past president of the Society of University Neurosurgeons and past chair of the Joint Section on Cerebrovascular Disease. He has been heavily involved in research, particularly in neuroradiology and neurosurgery cooperative projects. His current laboratory research involves the use of stem cells in stroke recovery.

He has published over 400 peer reviewed publications, abstracts, and book chapters, and has co-edited four textbooks on cerebral ischemia, cerebral AVM's, and interventional neuroradiology/endovascular neurosurgery.

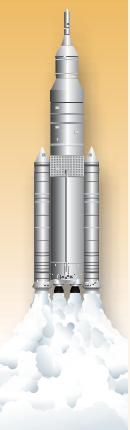
Dr. Rosenwasser provides treatment for all types of neurovascular diseases, using both open micro-surgical and endovascular techniques. These include craniotomy for excision of AVM, craniotomy for aneurysmal clip ligation, carotid endarterectomy, glycerol rhizotomy, endovascular aneurysm coiling, embolization for AVM, stereotactic radiosurgery for AVM (Gamma Knife), carotid stent placement, balloon angioplasty, and thrombolysis for ischemic injury.

LOOK FOR DR. ROSENWASSER AT THE FOLLOWING SESSIONS:

OCTOBER 8 MONDAY 9:23-9:45 am
Honored Guest Presentation: The Neurosurgeon as a Stroke Specialist
 12:15-1:45 pm
Honored Guest Luncheon: The Business of Medicine in the 21st Century: Pearls and Pitfalls

Meet Dr. Rosenwasser in the CNS Xperience Lounge in the Exhibit Hall immediately following his General Scientific Session presentation.

OCTOBER 9 TUESDAY 9:30-9:47 am
Honored Guest Presentation: The Evolution of Neurovascular Surgery: Procedural or Disease Oriented?





WALTER E. DANDY ORATOR

Laird Hamilton

A Conversation with Laird Hamilton: Risk, Reward, and Overcoming Fear

Laird Hamilton is best known as an American big-wave surfer and pioneer in the world of action water sports. In addition to his affinity for the water, Hamilton is an inventor, author, producer, TV host, fitness and nutrition expert, husband, father, and adrenaline junkie who continuously pushes the limits of human possibility.

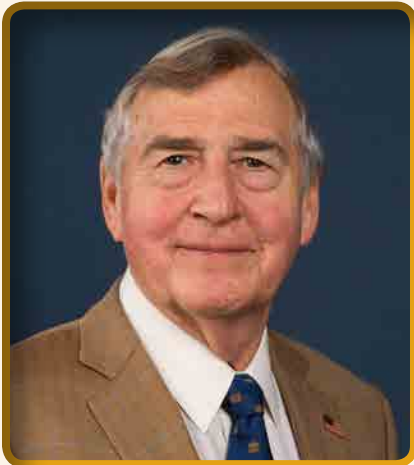
A hard-charging athlete, Hamilton is a renowned innovator and guiding genius of crossover board sports including tow-in surfing, stand-up paddle boarding, and hydrofoil boarding. Over the last decade, Hamilton has become an international fitness icon, nutrition expert, and trainer of top professional athletes and celebrities. Along with his wife, Gabrielle Reece, Hamilton created Extreme Performance Training (XPT), a unique training and lifestyle program

featuring water workouts, performance breathing, high-intensity and endurance training, and recovery methods.

Hamilton is the author of the bestselling book *Force of Nature: Mind, Body, Soul, and, Of Course, Surfing* (2008). He is also a contributing editor for *Men's Journal*. He has appeared in a number of feature films and surfing documentaries including *Step into Liquid* (2003), and *Riding Giants* (2004), where he also served as executive producer. He performed as a surfer in *The Descendants* (2014), *Water World* (1995), *Die Another Day* (2002) and *Point Break* (2015). In addition to his film work, Hamilton has appeared on numerous television shows such as *Oprah's Master Class*, *Charlie Rose*, *60 Minutes*, *Chelsea Handler*, *Conan O'Brien*, *Steven Colbert*, and *The Ellen DeGeneres Show*.

Hamilton has a passion for philanthropy and works with various non-profit organizations to help others live a happy, healthy life.

OCTOBER	11:50 am-12:15 pm
8	General Scientific Session II
MONDAY	Laird Hamilton will be signing copies of his book <i>Force of Nature</i> in the CNS Xperience Lounge in the Exhibit Hall immediately following the conclusion of this session.



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

Graham T. Allison

Douglas Dillon Professor of Government, Harvard Kennedy School

Graham T. Allison is an American political scientist and Douglas Dillon Professor of Government at the Harvard Kennedy School. He is a best-selling author and leading analyst of US national security and defense policy with a special interest in nuclear weapons, terrorism, and decision-making. Previously, Allison was Director of Harvard's Belfer Center for Science and International Affairs from 1995 until July 2017.

While serving as the Assistant Secretary of Defense during the Clinton Administration, Allison received the Defense Department's highest civilian award, the Defense Medal for Distinguished Public Service, for "reshaping relations with Russia, Ukraine, Belarus, and Kazakhstan to reduce the former Soviet nuclear arsenal."

In addition, Allison has served as Special Advisor to the Secretary of Defense under President Reagan. He has the sole distinction of having twice been awarded the Distinguished Public Service Medal, first by Secretary Cap Weinberger and second by Secretary Bill Perry. He served as a member of the Defense Policy Board for Secretaries Weinberger, Carlucci, Cheney, Aspin, Perry, Cohen, and Carter.

Allison has also written a number of bestseller and notable books, including *Destined for War: Can America and China Escape Thucydides's Trap?*, *Lee Kuan Yew: The Grand Master's Insights on China, the United States and the World* (co-authored with Robert Blackwill), *Nuclear Terrorism: The Ultimate Preventable Catastrophe*, and *Essence of Decision: Explaining the Cuban Missile Crisis*.

OCTOBER	11:50 am-12:15 pm
9	General Scientific Session III
TUESDAY	Graham Allison will be signing copies of his books in the CNS Xperience Lounge in the Exhibit Hall immediately following the conclusion of this session.





JOHN THOMPSON HISTORY OF MEDICINE LECTURER
Hugh Herr, PhD

The New Era of Extreme Bionics

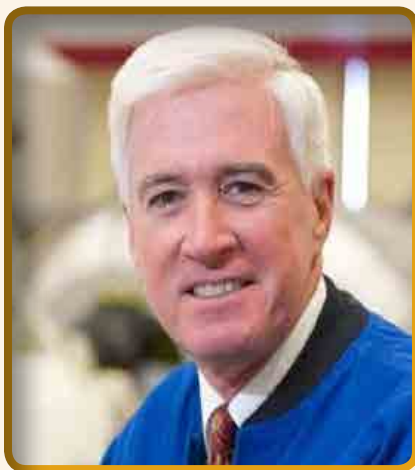
Hugh Herr is an engineer and biophysicist who creates bionic limbs that emulate the function of natural limbs. *TIME Magazine* coined Herr the “Leader of the Bionic Age” because of his revolutionary work in the emerging field of Biomechatronics—technology that marries human physiology with electromechanics. A double amputee, he is responsible for breakthrough advances in bionic limbs that provide greater mobility and new hope to those with physical disabilities. Herr is a professor of media arts and sciences at the MIT Media Lab, and co-director of the MIT Center for Extreme Bionics.

Herr has authored and co-authored more than 150 peer-reviewed manuscripts and patents chronicling the science and technology behind his many innovations. Two of Herr’s inventions, a computer-controlled knee prosthesis

called the Rheo, and a powered ankle-foot prosthesis called EmPower were named to the list of Top 10 Inventions in the health category by *TIME Magazine* in 2004 and 2007 respectively. Herr is the founder of BionX Inc., a company that commercializes the EmPower Ankle-Foot Prosthesis, allowing amputees to walk with normal levels of speed and metabolism, as if their legs were biological once again.

Herr has received many accolades, including the 13th Annual Heinz Award for Technology, the Economy and Employment; the Prince Salman Award for Disability Research; the Smithsonian American Ingenuity Award in Technology, and the 2016 Princess of Asturias Award for Technical & Scientific Research. Herr’s story has been told in a National Geographic film, *Ascent: The Story of Hugh Herr*, as well as in episodes and articles featured on CNN, *The Economist*, *Discover*, and *Nature*.

OCTOBER	11:47 am–12:15 pm
10	General Scientific Session IV
WEDNESDAY	Meet Hugh Herr in the CNS Xperience Lounge in the Exhibit Hall immediately following his presentation.



SPECIAL LECTURER
Smith L. Johnston III, MD, MS

Space Medicine, Terrestrial Applications for Human Health, Performance, and Longevity

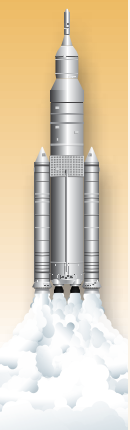
Smith Johnston, from Woodstock, Georgia, received his Doctor of Medicine in 1981 from Emory University in Atlanta, Georgia. From 1984 to 1990, Dr. Johnston completed residencies in Internal and Aerospace Medicine from Wright State University, as well as a Master of Science in Aerospace and Preventive Medicine.

Dr. Johnston is a member of the clinical faculty at the University of Texas Medical Branch, Department of Preventive, Occupational and Environmental Medicine in Galveston, Texas. He has spent most of his career as a medical officer and flight surgeon for NASA Medical Operations Branch at the NASA Johnson Space Center in Houston. Over the past 25 years, he has supported the

medical care of the active Astronaut Corps, their families, and retired astronauts. He has been the lead physician for the International Space Station (ISS) Emergency Medical System and Crew Return Vehicle development, and has supported two Expedition ISS missions and over 25 shuttle missions. Over the last five years, he has served as the medical director of NASA-JSC Aerospace and Occupational Medicine Clinics, and is presently the lead of NASA’s Astronaut Medical Selection and Retention Standards, and the Fatigue Management and Human Health, Performance, and Longevity Programs.

Dr. Johnston is board certified in aerospace medicine from the American Board of Preventive Medicine, and a fellow of the Aerospace Medical Association. He has been featured in media such as NOVA, Discovery Channel, *Scientific America*, *The New York Times*, *The Wall Street Journal*, *Houston Chronicle*, *Consumer Reports*, and *USA Today*.

OCTOBER	4:41–5:03 pm
7	General Scientific Session I
SUNDAY	





SPECIAL LECTURER
Al Unser Jr.

A Conversation with Al Unser Jr.: The Nervous System at 220 MPH!

A member of the famous racing Unser family, over the course of his illustrious driving career Al Unser Jr. has carved out his position in the sport as one of the all-time greats. In total, Al Jr. amassed 34 IndyCar wins. He is a two-time winner of the Greatest Spectacle in Racing – the Indianapolis 500 – where, by the way, his family has achieved a remarkable total of nine (9) victories. He is a two-time IndyCar champion and a two-time champion of the International Race of Champions (IROC). He is also fondly known as the “King of the Beach” for his record six wins in the prestigious Long Beach Grand Prix. Having retired from active driving in 2007, Al Jr. remains a prominent face in the sport, currently serving as an

executive consultant and driver coach for IndyCar Series team Harding Racing.

OCTOBER	6:03 – 6:30 pm
7	General Scientific Session I
SUNDAY	



SPECIAL LECTURER
David Eagleman

Can We Create New Senses for Humans?

David Eagleman is a neuroscientist and a *New York Times* bestselling author. He heads the Center for Science and Law, a national non-profit institute, and serves as an adjunct professor at Stanford University. He is best known for his work on sensory substitution, time perception, brain plasticity, synesthesia, and neurolaw.

He is the writer and presenter of the international PBS series, *The Brain with David Eagleman*, and the author of the companion book, *The Brain: The Story of You*. Beyond his 100+ academic publications, he has published many popular books. His bestselling book, *Incognito: The Secret Lives of the Brain*, explores the neuroscience “under the hood” of the conscious mind: all the aspects of neural function to which we have no awareness or access. His work of fiction, *SUM*, is an international bestseller and has been turned into two operas. Other books

include *Why the Net Matters*, the award-winning *Wednesday is Indigo Blue*, and *The Runaway Species*, co-authored with music composer Anthony Brandt.

Eagleman is a TED speaker, a Guggenheim Fellow, a winner of the McGovern Award for Excellence in Biomedical Communication, a Next Generation Texas Fellow, and vice-chair on the World Economic Forum’s Global Agenda Council on Neuroscience & Behaviour. He is founder of the company BrainCheck and the cofounder of the company NeoSensory. He has been profiled on the *Colbert Report*, *NOVA Science Now*, *The New Yorker*, CNN’s *The Next List*, and appears regularly on radio and television to discuss literature and science.

OCTOBER	9:10 – 9:30 am
10	General Scientific Session IV
WEDNESDAY	David Eagleman will be signing copies of his books in the CNS Xperience Lounge in the Exhibit Hall immediately following his presentation.



THE 2ND ANNUAL PAPER OF THE YEAR AWARDS

TOP PAPER
OF THE
YEAR

PAPER OF THE
YEAR, SELECT
SUBSPECIALTIES*

The CNS and NEUROSURGERY® Publications honor the most impactful papers published in *Neurosurgery* from July 2017–June 2018.

Join us to celebrate leading papers exploring new frontiers in science.

2018 CNS Annual Meeting
MISSION: NEUROSURGERY
October 6–10, 2018

Visit cns.org/2018 to learn more and register

 #CNS2018

*Cerebrovascular, Neurotrauma & Critical Care, Pain, Pediatrics, Socioeconomics, Health, Policy, & Law, Spine & Peripheral Nerve, Stereotactic & Functional, and Tumor.



2018 ANNUAL MEETING

HOUSTON, TEXAS
OCTOBER 6–10, 2018



Engage at the CNS Xperience Lounge

Relax on one of our cozy couches or connect with your colleagues. Grab a latte and see what's next on your agenda. Join us on Monday for snacks and Monday and Tuesday for wine and beer!

Meet and interact with the winning authors of the *Neurosurgery* Paper of the Year Awards, featured speakers, and Honored Guest, Robert H. Rosenwasser, MD. Books by our speakers will be available for purchase, so don't miss a chance to get yours signed.



See presentations from the Innovator of the Year finalists – and vote for your favorite. On Tuesday, check out continuing conversations by the CEOs of some of the country's most prominent hospitals. Stop by any time to view digital posters.

Experience live surgery via telemedicine technology on the Presentation Stage, where you can also watch Educational Update Sessions, an FDA Session, and more.

Ask any membership questions you might have and get answers from staff members. CNS merchandise will be available for purchase.



NEUROSURGERY® Publications will be in the Xperience Lounge! Stop by to pick up the latest copy of the journal, watch demos of the Surgeon's Armamentarium, listen to *Neurosurgery Speaks!* or chat with journal staff.

PRESIDENT**Ashwini D. Sharan, MD, FACS**

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

Dr. Sharan is an internationally recognized leader in functional neurosurgery, particularly in the growing field of epilepsy surgery. He is a leader and teacher in the areas of spine surgery, deep brain stimulation, intrathecal pumps, and spinal cord stimulators. Dr. Sharan has been the co-investigator on four NIH and DARPA grants. Currently, he is receiving funding from the Groff Foundation and studying the role of sphenopalatine ganglion stimulation for disruption of the brain-blood barrier. His work has been published in many journals including *Neurology*, *Neurosurgery*, *Spine*, *Epilepsia*, *Neuromodulation*, and *Orthopedic*, and he has been cited over 2,200 times.

Dr. Sharan has previously served as the president of the North American Neuromodulation Society (NANS). He is a founder of multiple startups, including Cerebral Therapeutics, Mudjala, Neurotargeting, and Tigerlabs. Dr. Sharan also holds a number of US patents. He has the distinction of being the first surgeon to perform laser ablation for epilepsy outside of the US—in AIIMS New Delhi, India. He has received “The Teacher of the Year” award several times.

The joy of Dr. Sharan’s life is his family. He lives in the suburbs of Philadelphia, Pennsylvania, with his wife, Kanu Priya Sharan, a breast cancer oncologist, and their two children, Isha Priya and Maansi Dayal. The Sharan family is actively involved with their community and prioritize local philanthropy and volunteerism.

**PRESIDENT-ELECT
Ganesh Rao, MD**

Ganesh Rao is an associate professor of neurosurgery at The University of Texas MD Anderson Cancer Center (MDACC). He is the adjunct associate professor of neurosurgery at Baylor College of Medicine (BCM) and the program director for the Neurosurgery Residency at BCM.

Dr. Rao attended medical school at the University of Arizona. He completed his neurosurgery residency under the leadership of M. Peter Heilbrun, MD, and trained under William T. Couldwell, MD, PhD. During his residency, he spent two years in the laboratory of Daniel Fuels, MD. After completing residency, he spent a year as a fellow in neurosurgical oncology at MDACC under the guidance of Raymond Sawaya, MD. He joined the faculty at MDACC in 2006.

In addition to a clinical practice, which includes the treatment of cranial and spinal neoplasms, Dr. Rao has an active laboratory. He has held a K-08 and currently holds R-01 funding for research into the mechanisms of malignant progression in glioma. He is also an active clinical researcher with numerous publications on a variety of neuro-oncological topics.

As the program director of a large residency program, Dr. Rao has been committed to education of residents and fellows. He is also heavily involved in the education of the neuro-oncology fellows at MDACC.

Dr. Rao and his wife Lorelei live in Bellaire, Texas, with their twin nine-year-old sons Kiran and Zain.



ANNUAL MEETING CHAIR Brian L. Hoh, MD

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

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

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

rupture, as well as innovative tissue engineering technology to improve the treatment of cerebral aneurysms.

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

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

SCIENTIFIC PROGRAM CHAIR Alexander A. Khalessi, MD, MS

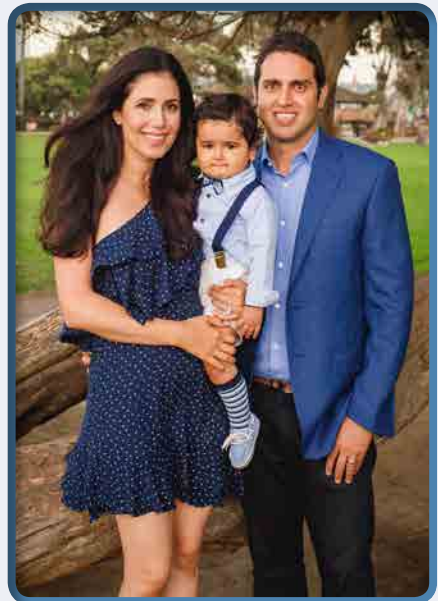
Alexander A. Khalessi is the chairman of neurological surgery at the University of California, San Diego. He completed undergraduate and Master of Science degrees with honors from Stanford University and MD from the Johns Hopkins University School of Medicine. He completed his neurosurgical residency at the University of Southern California, and an endovascular neurosurgery fellowship at SUNY Buffalo.

Dr. Khalessi is a recognized thought leader in the microsurgical and endovascular treatment of cerebral aneurysms, arteriovenous malformations (AVM), carotid disease, intracranial hemorrhage, and ischemic stroke. He is responsible for more than 115 peer reviewed papers, 150 abstract presentations, and served as principal or co-investigator of more than 15 clinical trials.

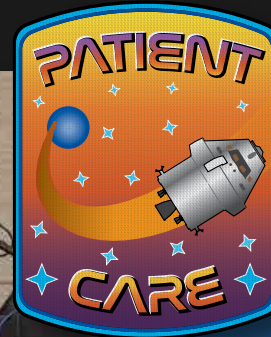
Dr. Khalessi further serves on the NIH/NINDS Interventional Advisory Panel for *StrokeNet*.

As a committed teacher, Dr. Khalessi served four years on the Residency Review Committee (RRC) for Neurological Surgery and serves as a Scholar-in-Residence for the American Board of Neurological Surgery (ABNS).

He lives in La Jolla, California, with his wife Sara, a lawyer, and son Wilder.



EVERY NEUROSURGEON HAS A PATIENT STORY TO TELL. SHARE YOURS.



CASE-BASED DISCUSSION SESSIONS

Submit your case for the opportunity to be featured at interactive panel discussions.

Discuss and collaborate with your peers while you get an outsider's perspective of your cases. You'll hear and see alternative and opposing managements and surgical approaches that will impact your practice and patient care.

Submission categories:

- ▶ Outpatient Neurosurgery: From Office to ASC—Optional or Necessary?
- ▶ Cervical and Thoracolumbar Trauma
- ▶ Management of Pediatric Spine Trauma
- ▶ STN versus GPI: Key Clinical Trials
- ▶ Brain Metastases
- ▶ Treatment of Cerebral Aneurysms
- ▶ Spinal Deformity and MIS Surgery
- ▶ Ethical Controversies in Neurotrauma
- ▶ Surgical Techniques in Trigeminal Neuralgia
- ▶ Myelomeningocele and Associated Pathologies: Variable Practice Management
- ▶ The Changing Face of Epilepsy Surgery
- ▶ Challenging Tumors
- ▶ Multi-Modality Treatment of Cerebral AVMs
- ▶ Challenging Cases: TBI

Submit your most thought-provoking or challenging cases at
cns.org/casebased

Cases must be submitted by July 31

Visit **CNS.ORG/2018** to join
the **CNS Annual Meeting**

 **#2018CNS**



**2018 ANNUAL
MEETING**

**HOUSTON, TEXAS
OCTOBER 6-10, 2018**





ANNUAL MEETING CHAIR
Brian L. Hoh



SCIENTIFIC PROGRAM CHAIR
Alexander A. Khalessi



VICE-SCIENTIFIC PROGRAM CHAIR
Nader Pouratian

THANK YOU to the following:

Industry Relations

Daniel J. Hoh
Elad I. Levy

Members-at-Large SPC Liaisons

Mohamed Bydon – *Dinner Seminars*
Daniel J. Hoh – *Guidelines*
Brian V. Nahed – *Luncheon Seminars*
Nader Pouratian – *General Scientific Sessions*
Martina Stippler – *Practical Courses*
Jennifer A. Sweet – *Symposia*

**The Congress of Neurological Surgeons Welcomes
2018 International Partner
Brazilian Society of Neurosurgery**



THANK YOU TO OUR SECTION SCIENTIFIC

Section on Cerebrovascular Surgery

Scott D. Simon
Stavroupla I. Tjoumakaris
Chad W. Washington



Council of State Neurological Societies

Analiz Rodriguez
Clemens M. Schirmer
Anand Veeravagu



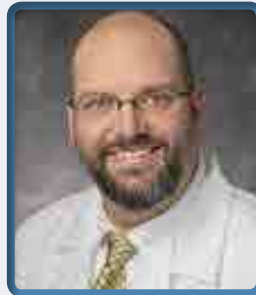
Section on Disorders of the Spine and Peripheral Nerves

Daniel J. Hoh
Laura A. Snyder
Khoi D. Than



Section on Neurotrauma & Critical Care

Kathryn M. Beauchamp
Alan S. Hoffer
Craig H. Rabb



Section on Pain

Sean J. Nagel
Erika A. Petersen
Jason M. Schwalb



PROGRAM COMMITTEE CONTRIBUTORS



Section on Pediatric Neurological Surgery

Lissa C. Baird
Todd C. Hankinson
Amy Lee
Elias B. Rizk



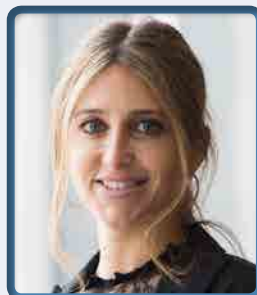
Section on Stereotactic and Functional Neurosurgery

Jonathan Miller
Alon Y. Mogilner
Sameer A. Sheth



Section on Tumors

Seunggu J. Han
Gordon Li
Jason P. Sheehan



Women in Neurosurgery

Ellen L. Air
Ann M. Parr
Martina Stippler
Jennifer A. Sweet

THANK YOU



YOUR DAY **CV** CEREBROVASCULAR

SUBSPECIALTY SESSION HIGHLIGHTS

OCTOBER
6
SATURDAY

PRACTICAL COURSE
8:00–11:30 am
PC04 | Bypass Techniques and Cerebrovascular Neurosurgery (pg 28)

SYMPOSIUM
8:00 am–4:00 pm
SYM1 | Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon (pg 27)

OCTOBER
7
SUNDAY

PRACTICAL COURSES
8:00–11:30 am
PC17 | New Era in Stenting (pg 34)

OCTOBER
8
MONDAY

7:00–8:30 am
Sunrise Science and Late Breaking Abstract Session

LUNCH SEMINARS
12:15–1:45 pm
M03 | Is Intracerebral Hemorrhage a Surgical Disease? (pg 42)
M04 | Venous Stenting for Pseudotumor (pg 42)
2:45–4:15 pm
Section on Cerebrovascular Surgery (pg 42)

CASE-BASED DISCUSSION
4:15–6:15 pm
Case-based Discussion Session: Treatment of Cerebral Aneurysms (pg 49)

DINNER SEMINAR
7:30–9:30 pm
DIN2 | Advances and Controversies in Intracranial AVM Management (pg 48)

OCTOBER
9
TUESDAY

GUIDELINES
7:00–8:30 pm
Cerebrovascular Guidelines: Aneurysms, Arteriovenous Malformations, and Acute Ischemic Stroke (pg 49)

LUNCH SEMINARS
12:15–1:45 pm
T13 | Dural AV Fistula: Diagnosis, Classification, and Management (pg 52)
T14 | Update on the Management of Anti-coagulation and Anti-platelet Therapies in Neurosurgical Patients (pg 52)

SECTION SESSION
2:45–4:15 pm
Section on Cerebrovascular Surgery (pg 54)

CASE-BASED DISCUSSION
4:15–6:15 pm
Case-based Discussion Session: Multi-modality Treatment of Cerebral AVMs (pg 56)

OCTOBER
10
WEDNESDAY

LUNCH SEMINARS
12:15–1:45 pm
W23 | Spinal Arteriovenous Fistulae and Malformations: Management Strategies in 2018 (pg 62)
W24 | Contemporary and Practical Management of an Enigmatic Process: Cerebral and Vasospasm (Delayed Cerebral Ischemia) (pg 62)

Look for the **CV** throughout the program for sessions and science that pertain to your specialty.

YOUR DAY **PA** PAIN



OCTOBER
7
SUNDAY

PRACTICAL COURSE

8:00–11:30 am

PC21 | Neurosurgical Treatment of Chronic Headache (pg 34)

OCTOBER
8
MONDAY

SECTION SESSION

2:45–4:15 pm

Section on Pain (pg 45)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: Surgical Techniques in Trigeminal Neuralgia from the Masters (pg 47)

OCTOBER
9
TUESDAY

LUNCH SEMINAR

12:15–1:45 pm

T18 | SCS: Evidence and Applications (pg 52)

SECTION SESSION

2:45–4:15 pm

Section on Pain (pg 54)

OCTOBER
10
WEDNESDAY

7:00–8:30 am

Sunrise Science and Late Breaking Abstract Session

Look for the **PA** throughout the program for sessions and science that pertain to your specialty.

YOUR DAY **PE** PEDIATRIC

OCTOBER
6
SATURDAY

PRACTICAL COURSE

8:00–11:30 am

PC05 | Endoscopic Crainiosynostosis Repair: Hands-on Course (pg 28)

OCTOBER
7
SUNDAY

PRACTICAL COURSE

8:00–11:30 am

PC26 | Big Data—Core Principles of Data Science for Neurosurgeons (pg 36)

OCTOBER
8
MONDAY

LUNCH SEMINAR

12:15–1:45 pm

M08 | Management of Brachial Plexus Injuries: From Birth to Adult (pg 42)

SECTION SESSION

2:45–4:15 pm

Section on Pediatric Neurological Surgery (pg 45)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: Myelomeningocele and Associated Pathologies: Variable Practice Management (pg 47)

OCTOBER
9
TUESDAY

LUNCH SEMINAR

12:15–1:45 pm

T19 | Pediatric Dystonia: Advancements with DBS and Management Updates (pg 52)

SECTION SESSION

2:45–4:15 pm

Section on Pediatric Neurological Surgery (pg 54)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: Management of Pediatric Spine Trauma (pg 56)

OCTOBER
10
WEDNESDAY

7:00–8:30 am

Sunrise Science and Late Breaking Abstract Session

LUNCH SEMINAR

12:15–1:45 pm

W28 | Pediatric Head Trauma (pg 46)

Look for the **PE** throughout the program for sessions and science that pertain to your specialty.



YOUR DAY **SE** SOCIOECONOMIC

SUBSPECIALTY SESSION HIGHLIGHTS

OCTOBER
6
SATURDAY

PRACTICAL COURSES
12:30–4:00 pm
 PC10 | Innovation, Quality, and Safety—A Balance along the Continuum of Care for Neurosurgical Patients (pg 29)

12:30–4:00 pm
 PC15 | Neurosurgeon-hospital Relationships: Options, Negotiations, and Achieving What You Are Worth (pg 30)

DINNER SEMINAR
6:30–8:30 pm
 DIN1 | The Bottom Line in a Changing World—Updates About CPT, ICD-10, MIPS, and Bundling (pg 31)

OCTOBER
7
SUNDAY

PRACTICAL COURSE
8:00–11:30 am
 PC18 | CPT Update (pg 34)

OCTOBER
8
MONDAY

LUNCH SEMINAR
12:15–1:45 pm
 M02 | Navigating MACRA/MIPS and Bundled Payments (pg 42)

SECTION SESSION
2:45–4:15 pm
 Council of State Neurosurgical Societies (pg 44)

CASE-BASED DISCUSSION
4:15–6:15 pm
 Case-based Discussion Sessions: Outpatient Neurosurgery—From Office to ASC—Optional or Necessary? (pg 47)

OCTOBER
9
TUESDAY

7:00–8:30 am
 Sunrise Science and Late Breaking Abstract Session

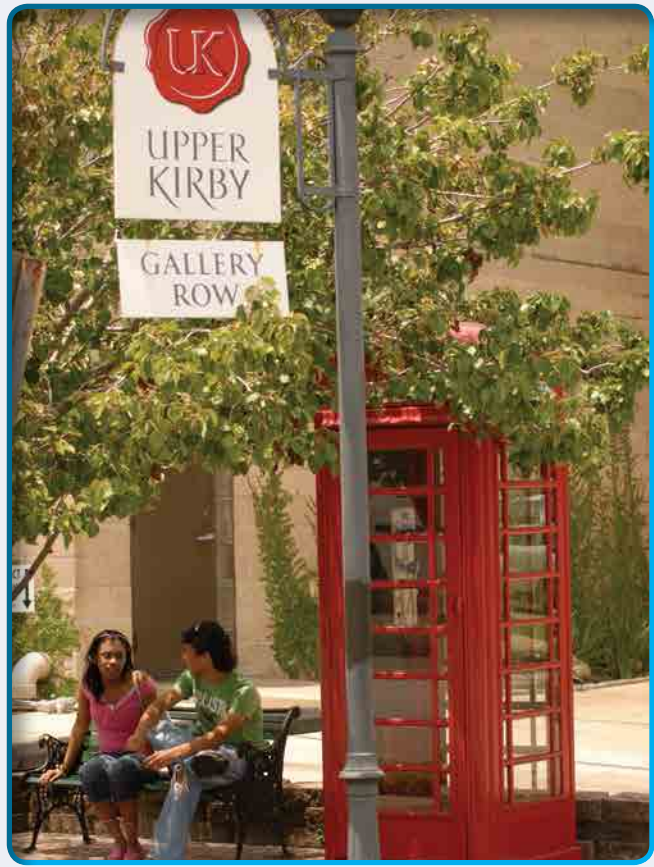
LUNCH SEMINAR
12:15–1:45 pm
 T12 | Medical Malpractice Update 2018 (pg 52)

SECTION SESSION
2:45–4:15pm
 Council of State Neurosurgical Societies (pg 54)

OCTOBER
10
WEDNESDAY

LUNCH SEMINARS
12:15–1:45 pm
 W31 | Enhancing Communication Skills to Lead Your Practice (pg 62)

Look for the **SE** throughout the program for sessions and science that pertain to your specialty.



YOUR DAY **SF** STEREOTACTIC AND FUNCTIONAL



OCTOBER
6
SATURDAY

PRACTICAL COURSE

8:00–11:30 am

PC06 | Update on Movement Disorders: Case-based Review of Approaches and Controversies (pg 28)

OCTOBER
7
SUNDAY

PRACTICAL COURSE

8:00–11:30 am

PC22 | Review of Functional Neurosurgery for the Non-specialist (pg 35)

OCTOBER
8
MONDAY

LUNCH SEMINAR

12:15–1:45 pm

M09 | Key Clinical Trials in Epilepsy Surgery (pg 43)

SECTION SESSION

2:45–4:15 pm

Section on Stereotactic and Functional Neurosurgery (pg 45)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: The Changing Face of Epilepsy Surgery (pg 47)

OCTOBER
9
TUESDAY

SECTION SESSION

2:45–4:15 pm

Section on Stereotactic and Functional Neurosurgery (pg 55)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: STN Versus GPI: Key Clinical Trials (pg 56)

DINNER SEMINAR

7:30–9:30 pm

DIN4 | Emerging Indications for Functional Neurosurgery: Tourette, OCD, Depression, and Pain (pg 57)

OCTOBER
10
WEDNESDAY

7:00–8:30 am

Sunrise Science and Late Breaking Abstract Session

Look for the **SF** throughout the program for sessions and science that pertain to your specialty.

Get More CME from Your Meeting!

SANS Supplemental Exams



CNS

SANS
Lifelong Learning

Earn one hour of additional CME credit through supplemental exams. Annual Meeting attendees can purchase exams for each of the following lunch seminars:

- ◆ SANS Severe TBI Update: Trends and Tools (Practical Course 01)
- ◆ SANS Spinal Trauma and Spinal Cord Injury: Case-based Presentations and Future Directions (Practical Course 11)
- ◆ SANS Review of Functional Neurosurgery for the Non-Specialist (Practical Course 22)
- ◆ SANS Cervical Spondylotic Myelopathy: Anterior Versus Posterior Approaches (Lunch Seminar M06)
- ◆ SANS Acoustic Neuromas: Current Management Strategies (Lunch Seminar M11)
- ◆ SANS Malignant Gliomas: Advances in Surgery and Adjuvant Therapy (Lunch Seminar T20)
- ◆ SANS Peripheral Nerve Entrapment Syndromes: Diagnosis and Management (Lunch Seminar W26)

Each exam costs \$15 and any Annual Meeting attendee may purchase one or more exams, regardless of live course attendance.



YOUR DAY **SP** SPINE AND PERIPHERAL NERVES

OCTOBER
6
SATURDAY

PRACTICAL COURSES

8:00–11:30 am

PC02 | Minimally Invasive Spine Surgery—Case-based Complications and Future Directions (pg 28)

PC03 | Cervical Spine Case Management: Techniques and Technologies Update (pg 28)

12:30–4:00 pm

PC11 | Spinal Trauma and Spinal Cord Injury: Case-based Presentation and Future Directions (pg 29)

PC12 | My Worst Spinal Complication: What I Learned (pg 30)

PC13 | Peripheral Nerve Surgery: Techniques and Exposure (pg 30)

OCTOBER
7
SUNDAY

PRACTICAL COURSES

8:00–11:30 am

PC19 | Spinal Biomechanics in Modern Clinical Practice (pg 34)

PC20 | Thoracolumbar Spinal Deformity for the Non-Deformity Spine Surgeon (pg 34)

OCTOBER
8
MONDAY

GUIDELINES

7:00–8:30 am

Guidelines for Acute Cervical and Thoracolumbar Spine Trauma (pg 39)

LUNCH SEMINARS

12:15–1:45 pm

M05 | Controversies in Spinal Deformity Surgery (pg 42)

M06 | Cervical Spondylotic Myelopathy: Anterior Versus Posterior Approaches (pg 42)

SECTION SESSION

2:45–4:15 pm

Section on Disorders of the Spine and Peripheral Nerves (pg 44)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: Spinal Deformity and MIS Surgery (pg 47)

DINNER SEMINAR

7:30–9:30 pm

DIN3 | Robotics and Spinal Surgery: The Future is Now (pg 48)

OCTOBER
9
TUESDAY

7:00–8:30 am

Sunrise Science and Late Breaking Abstract Session

LUNCH SEMINARS

12:15–1:45 pm

T15 | Spinal Tumor Surgery: Case-based Management (pg 52)

T16 | Peak Performance: Optimizing the Spine Surgical Patient from Pre-op to Post-op (pg 52)

SECTION SESSION

2:45–4:15 pm

Section on Disorders of the Spine and Peripheral Nerves (pg 54)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: Cervical and Thoracolumbar Trauma (pg 56)

OCTOBER
10
WEDNESDAY

LUNCH SEMINARS

12:15–1:45 pm

W25 | Novel Techniques for Management of Lumbar Spondylolisthesis (pg 62)

W26 | Peripheral Nerve Entrapment Syndromes: Diagnosis and Management (pg 62)

Look for the **SP** throughout the program for sessions and science that pertain to your specialty.

YOUR DAY **TR** NEUROTRAUMA



OCTOBER
6
SATURDAY

PRACTICAL COURSE

8:00 am–4:00 pm

PC01 | Severe TBI Update: Trends and Tools (pg 28)

OCTOBER
7
SUNDAY

PRACTICAL COURSE

8:00–11:30 am

PC25 | Concussion: Advances in Mild Brain Injury Science (pg 35)

OCTOBER
8
MONDAY

LUNCH SEMINAR

12:15–1:45 pm

M07 | Management of Chronic Subdural Hematoma (pg 42)

CASE-BASED DISCUSSION

4:15–6:15 pm

Cased-based Discussion Session—Challenging Cases: TBI (pg 47)

OCTOBER
9
TUESDAY

7:00–8:30 am

Sunrise Science and Late Breaking Abstract Session

LUNCH SEMINAR

12:15–1:45 pm

T17 | Combat and Mass-casualties: Neurosurgery Under Fire (pg 52)

SECTION SESSION

2:45–4:15 pm

Section on Neurotrauma and Critical Care (pg 54)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: Ethical Controversies in Neurotrauma (pg 56)

OCTOBER
10
WEDNESDAY

LUNCH SEMINARS

12:15–1:45 pm

W27 | Sports-related Injuries (pg 62)

W28 | Pediatric Head Trauma (pg 62)

Look for the **TR** throughout the program for sessions and science that pertain to your specialty.





YOUR DAY **TU** TUMOR

OCTOBER
6
SATURDAY

PRACTICAL COURSES

8:00–11:30 am

PC07 | Modern Applications of Radiosurgery (pg 29)

PC09 | 3D Surgical Neuroanatomy (Supratentorial) (pg 29)

12:30–4:00 pm

PC14 | 3D Surgical Neuroanatomy (Infratentorial) (pg 30)

OCTOBER
7
SUNDAY

PRACTICAL COURSES

8:00–11:30 am

PC23 | Surgical Management of Eloquent Area Tumors: Functional Mapping and/or Navigation (pg 35)

PC24 | Brain Tumor Update Part 1: Malignant Brain Tumors (pg 35)

12:30–4:00 pm

PC27 | Brain Tumor Update Part 2: Benign Brain Tumors (pg 36)

OCTOBER
8
MONDAY

7:00–8:30 am

Sunrise Science and Late Breaking Abstract Session

LUNCH SEMINARS

12:15–1:45 pm

M10 | Update on Diagnosis and Management of Low-grade Gliomas (pg 43)

M11 | Acoustic Neuromas: Current Management Strategies (pg 43)

SECTION SESSION

2:45–4:15 pm

Section on Neurotrauma and Critical Care (pg 44)

Section on Tumors (pg 46)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: Challenging Tumors (pg 47)

OCTOBER
9
TUESDAY

LUNCH SEMINARS

12:15–1:45 pm

T20 | Malignant Gliomas: Advances in Surgery and Adjuvant Therapy (pg 53)

T21 | Management of Pituitary Adenomas and Parasellar Pathology (pg 53)

SECTION SESSION

2:45–4:15 pm

Section on Tumors (pg 55)

CASE-BASED DISCUSSION

4:15–6:15 pm

Case-based Discussion Session: Brain Metastases Current Case review (pg 56)

OCTOBER
10
WEDNESDAY

GUIDELINES

7:00–8:30 am

Guidelines on Skull Base Update (pg 59)

LUNCH SEMINARS

12:15–1:45 pm

W29 | Cutting Edge Management of Brain Metastasis (pg 62)

W30 | Advanced Imaging of Brain Tumors (pg 62)

Look for the **TU** throughout the program for sessions and science that pertain to your specialty.



OCTOBER

6

SATURDAY

PRACTICAL COURSES

12:30–4:00 pm

PC08 | WINS Practical Course on Leadership and Education (pg 29)

PC09 | 3D Surgical Neuroanatomy (Supratentorial) (pg 29)

PC10 | Innovation, Quality, and Safety—A Balance Along the Continuum of Care for Neurosurgical Patients (pg 29)

PC13 | Peripheral Nerve Surgery: Techniques and Exposure (pg 30)

PC14 | 3D Surgical Neuroanatomy (Infratentorial) (pg 30)

OCTOBER

7

SUNDAY

PRACTICAL COURSES

12:30–4:00 pm

PC22 | Review of Functional Neurosurgery for the Non-specialist (pg 35)

PC25 | Concussion: Advances in Mild Trauma Brain Injury Science (pg 35)

PC26 | Big Data Cutting Edge Management Core Principles of Data Science for Neurosurgeons (pg 36)

OCTOBER

8

MONDAY

LUNCH SEMINARS

12:15–1:45 pm

M01 | Honored Guest Luncheon: The Business of Medicine in the 21st Century—Pearls and Pitfalls (pg 42)

M05 | Controversies in Spinal Deformity Surgery (pg 42)

M10 | Update on Diagnosis and Management of Low-grade Gliomas (pg 43)

OCTOBER

9

TUESDAY

LUNCH SEMINARS

12:15–1:45 pm

T15 | Spinal Tumor Surgery: Case-based Management (pg 52)

T22 | Diversity in Learning: New Initiatives in Mentorship (pg 53)

Look for the **RE** throughout the program for sessions and science that pertain to your specialty.



Annual Meeting special benefits for US Active Duty Military Members

The CNS has a long and distinctive heritage of serving our members who have so bravely served our country. To honor military neurosurgeons, the CNS is offering **complimentary registration and limited complimentary housing** to US Active Duty Military members.

Complimentary housing is available to a limited number of 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/2018.

If you are selected, you will be contacted by the CNS staff to confirm housing arrangements.

To view more member benefits the CNS offers its Active Duty Military members, visit cns.org/membership.

Non-members: 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.



YOUR DAY **AP** ADVANCED PRACTICE PROVIDER

OCTOBER
6
SATURDAY

PRACTICAL COURSES

8:00–11:30 am

PC03 | Cervical Spine Case Management: Techniques and Technology Update (pg 28)

PC06 | Update on Movement Disorders: Case Based Review of Approaches and Controversies (pg 28)

12:30–4:00 pm

PC10 | Innovation, Quality, and Safety—A Balance Along the Continuum of Care for Neurosurgical Patients (pg 29)

PC11 | Spinal Trauma and Spinal Cord Injury: Case-based Presentations and Future Directions (pg 29)

DINNER SEMINAR

6:30–8:30 pm

DIN1: The Bottom Line in a Changing World—Updates about CPT, ICD-10, MIPS, and Bundling (pg 31)

OCTOBER
9
TUESDAY

LUNCH SEMINARS

12:15–1:45 pm

T16 | Peak Performance: Optimizing the Spine Surgical Patient from Pre-op to Post-op (pg 52)

T19 | Pediatric Dystonia: Advancement with DBS and Management Updates (pg 52)

OCTOBER
10
WEDNESDAY

LUNCH SEMINARS

12:15–1:45 pm

W27 | Sports-related Injuries (pg 62)

W28 | Pediatric Head Trauma (pg 62)

OCTOBER
7
SUNDAY

PRACTICAL COURSES

8:00–11:30 am

PC18 | CPT Update (pg 34)

PC25 | Concussion: Advances in Mild Trauma Brain Injury Science (pg 35)

8:00 am–4:00 pm

PC16 | Association of Neurosurgical Physician Assistance (ANSPA) Fall 2018 CME Meeting Presenting and Collaboration with Congress of Neurological Surgeons (CNS) (pg 34)

12:30–4:00 pm

PC26 | Big Data—Core Principles of Data Science for Neurosurgeons (pg 36)

Look for the **AP** throughout the program for sessions and science that pertain to your specialty.

OCTOBER
8
MONDAY

LUNCH SEMINARS

12:15–1:45 pm

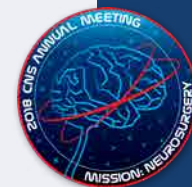
M02 | Navigating MACRA/MIPS and Bundled Payments (pg 42)

M09 | Key Clinical Trials in Epilepsy Surgery (pg 43)

M10 | Update on Diagnosis and Management of Low Grade Gliomas (pg 43)

M11 | Acoustic Neuromas: Current Management Strategies (pg 43)

YOUR DAY WINS



OCTOBER

6

SATURDAY

PRACTICAL COURSES

8:00–11:30 am

PC08 | WINS Practical Course on Leadership and Education (pg 29)

12:30–4:00 pm

PC10 | Innovation, Quality, and Safety—A Balance Along the Continuum of Care for Neurosurgical Patients (pg 29)

PC12 | My Worst Spinal Complication: What I Learned (pg 30)

PC15 | Neurosurgeon-hospital Relationships: Options, Negotiations, and Achieving What You Are Worth (pg 30)

6:30–8:30 pm

DIN1 | The Bottom Line in a Changing World—Updates about CPT, ICD-10, MIPS, and Bundling (pg 31)

OCTOBER

7

SUNDAY

8:00 am–4:00 pm

SYM2 | Surgical Robotics: Engineering to Bedside (pg 32)

PRACTICAL COURSE

12:30–4:00 pm

PC26 | Big Data—Core Principles of Data Science for Neurosurgeons (pg 36)

OCTOBER

8

MONDAY

LUNCH SEMINAR

12:15–1:45 pm

M01 | Honored Guest Lunch: The Business of Medicine in the 21st Century—Pearls and Pitfalls (pg 42)

OCTOBER

9

TUESDAY

LUNCH SEMINARS

12:15–1:45 pm

T21 | Medical Malpractice Update 2018 (pg 53)

T22 | Diversity in Learning: New Initiatives and in Mentorship (pg 53)

OCTOBER

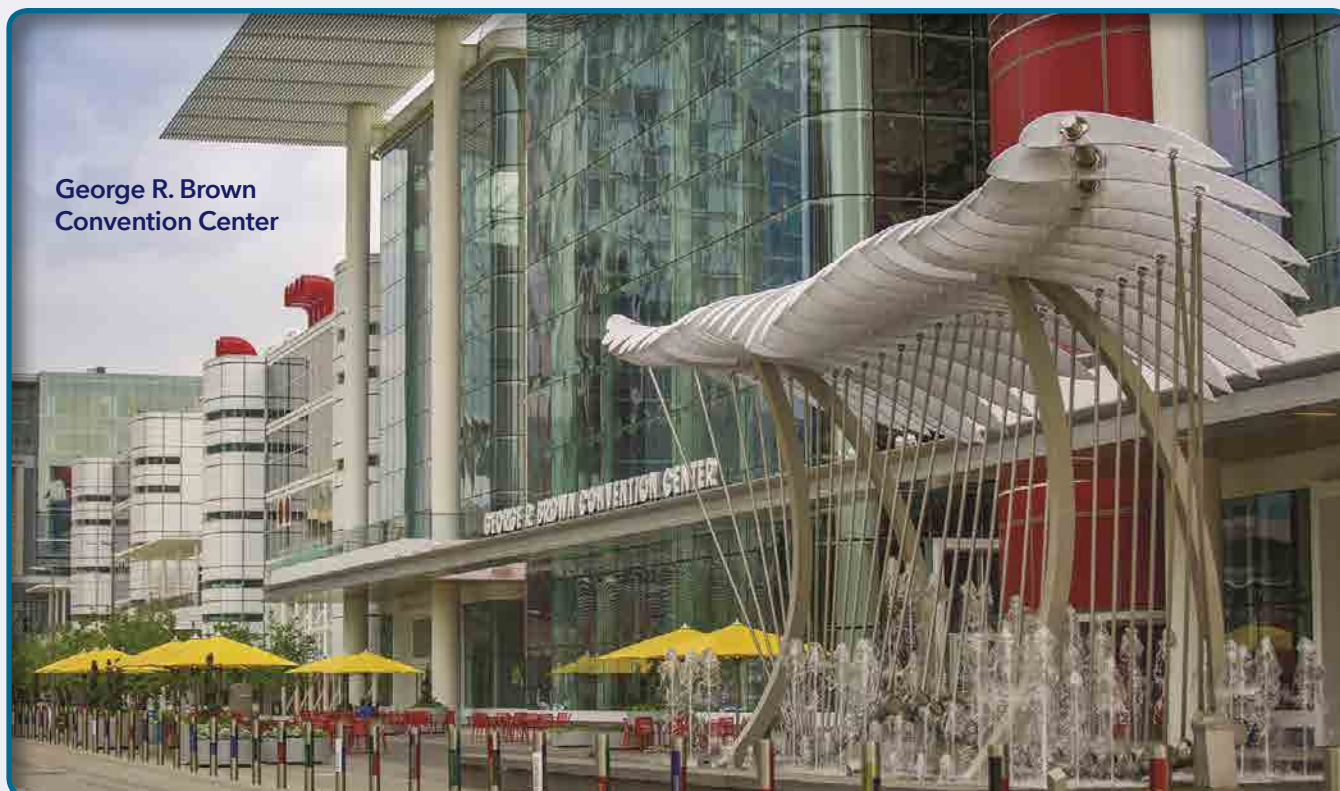
10

WEDNESDAY

LUNCH SEMINAR

12:15–1:45 pm

W31 | Enhancing Communication Skills to Lead Your Practice (pg 62)



SUBSPECIALTY SESSION HIGHLIGHTS

OCTOBER

6

SATURDAY

PROGRAM HIGHLIGHTS

8:00 am–4:00 pm

**SYM1 Neurovascular Update:
Evidence-based Guidelines in
Ischemic and Hemorrhagic Stroke
for the Practicing Neurosurgeon**



5:00–6:30 pm

International Reception



8:00–11:30 am

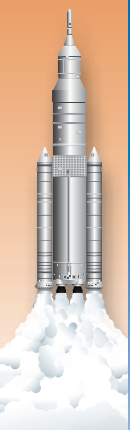
**PC08 WINS Practical Course on
Leadership and Education**



6:30–8:30 pm

**Dinner Seminar 1
The Bottom Line in a
Changing World—Updates about CPT,
ICD-10, MIPS, and Bundling**

III Forks



CV 8:00 am–4:00 pm \$300 Physician, \$200 Nurse/NP/PA, \$100 Resident/Medical Student

SYM1 Neurovascular Update: Evidence-based Guidelines in Ischemic and Hemorrhagic Stroke for the Practicing Neurosurgeon

Course Directors: Peter Kan, Adnan H. Siddiqui

Speakers: Sepideh Amin-Hanjani, Adam S. Arthur, Mark D. Bain, Ricardo A. Hanel, Robert E. Harbaugh, Brian L. Hoh, Brian T. Jankowitz, Peter Kan, Alexander A. Khalessi, Louis J. Kim, Michael T. Lawton, Elad I. Levy, Demetrius K. Lopes, R. Loch Macdonald, Michael W. McDermott, Brett C. Meyer, Christopher S. Ogilvy, Aditya S. Pandey, Adnan H. Siddiqui, Edward R. Smith, Gary K. Steinberg, Babu G. Welch

Course Description: This symposium provides a forum for attendees to obtain the latest information on ischemic and hemorrhagic strokes. It will start with patient selection for mechanical thrombectomy in the setting of large vessel occlusion, followed by discussing the current practice on endovascular and surgical revascularization for extracranial atherosclerotic diseases. The course will then switch to cover optimal treatment of intracranial aneurysms, including new technologies and the optimal treatment options of intracranial vascular malformations, and intracerebral hemorrhage.

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

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

8:00 am
Welcome
Peter Kan

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

8:00–8:15 am
**Mechanical
Thrombectomy in Wake
Up and Late-presenting
Stroke Patients: State of
the Art Evidence**
Brian T. Jankowitz

8:15–8:30 am
**Stent-retriever or
Primary Aspiration. Does
it make a Difference?**
Peter Kan

8:30–8:45 am
**Mechanical
Thrombectomy in
patients with Low NIHSS
and ASPECT Score: Is it
Beneficial or Harmful?**
Adnan H. Siddiqui

8:45–9:00 am
**Where Should Stroke
Patients be Evaluated?
Primary Stroke Centers,
Thrombectomy-
ready Centers, or
Comprehensive Stroke
Centers**
Adam S. Arthur

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

9:30–9:45 am
**Neuroprotective
Strategies in Acute
Ischemic Stroke**
Brett C. Meyer

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

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

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

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

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

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

11:15–11:45 am
**Didactic Session
3—Management
of Extracranial
Atherosclerotic and
Vaso-occlusive Disease:
An Update**

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

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

11:45 am–12:30 pm
**Afternoon Breakout
Session with Corporate
Sponsor and Lunch**

12:30–1:15 pm
**Didactic Session 4—
Optimal Treatment of
Intracranial Aneurysms:
An Update**

12:30–12:45 pm
**Primary or Adjunctive
Coiling of Intracranial
Aneurysms in the Era of
Expanding Technology**
Brian L. Hoh

12:45–1:00 pm
Bypass for Aneurysms
Michael T. Lawton

1:00–1:15 pm
**Cutting Edge Therapy for
Vasospasm: An Update**
R. Loch Macdonald

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

1:15–1:30 pm
Flow Diversion
Ricardo A. Hanel

1:30–1:45 pm
Endovascular Devices
Alexander A. Khalessi

1:45–2:00 pm
Novel Stents
Demetrius K. Lopes

2:00–2:15 pm
**Unruptured Aneurysms:
Who to Treat?**
Christopher S. Ogilvy

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

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

2:45–3:00 pm
**Surgical Management
for AVM**
Louis J. Kim

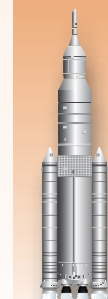
3:00–3:15 pm
Endovascular Treatment
Aditya S. Pandey

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

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

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

3:45–4:00 pm
Questions and Discussion



TR 8:00 am–4:00 pm \$650 Physician, \$425 Nurse/NP/PA,
\$175 Resident/Medical Student



CNS

SANS
Lifelong Learning

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

NEW

PC01 Severe TBI Update: Trends and Tools

Course Directors: Shelly D. Timmons, Gregory W.J. Hawryluk
Faculty: Randy S. Bell, Randall M. Chesnut, Michael Cusimano,
Rodrigo M. Faleiro, Jamshid Ghajar, Alan S. Hoffer, Ryan S.
Kitagawa, Geoffrey T. Manley, David O. Okonkwo, Laura B.
Ngwenya, Richard B. Rodgers, Uzma Samadani, Jamie S.
Ullman

Course Description: Novel treatments such as hypothermia,
hyperbaric oxygen, hypertonic saline. Invasive and non-
invasive tools for neuromonitoring. Hands-on (breakout)
session with new technologies.

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

- › Integrate current strategies in TBI management into daily practice.
- › Implement novel approaches to the treatment of TBI.
- › Identify new technologies for neuromonitoring.

SP 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

PC02 Minimally Invasive Spine Surgery—Case-based Complications and Future Directions

Course Directors: Praveen V. Mummaneni, Adam S. Kanter
Faculty: Aaron J. Clark, Kevin T. Foley, Roger Hartl, Langston T.
Holly, Khoi D. Than, Juan S. Uribe

Course Description: This course will discuss state-of-the-art,
minimally invasive techniques and how past complications
have led to current trends and future directions.

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

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

SP 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

NEW

PC03 Cervical Spine Case Management: Techniques and Technology Update

Course Director: Andrew T. Dailey
Faculty: Kurt M. Eichholz, R. John Hurlbert, Sheng-fu Larry Lo,
Osmar Moraes, Srinivas K. Prasad, Wilson Z. Ray, Charles A.
Sansur

Course Description: This course will be comprised of case-
based discussions of modern anterior/posterior/combined
techniques to treat common cervical spine pathologies.

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

- › Discuss indications for surgical treatment of cervical spine pathologies.
- › Discuss decision-making strategies for selecting the appropriate surgical approach for cervical spine pathologies.
- › Identify and avoid common complications associated with cervical spine surgery.

CV 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

NEW

PC04 Bypass Techniques in Cerebrovascular Neurosurgery

Course Director: Mark D. Bain

Faculty: Daniel L. Barrow, David J. Langer, Michael T. Lawton,
Peter A. Rasmussen, Jonathan Russin, Gary K. Steinberg

Course Description: Hear the latest indications and techniques
for extracranial to intracranial bypass. Practice anastomosis
on turkey wings.

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

- › Discuss the clinical and imaging indications for EC-IC bypass.
- › Appreciate the technical challenges of matching flow.
- › Learn tips and tricks for keeping anastomosis open post-op.

PE 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

NEW

PC05 Endoscopic Craniosynostosis Repair: Hands-on Course

Course Directors: David F. Jimenez, Matthew D. Smyth

Faculty: Amy Lee, Hal S. Meltzer, Mark R. Proctor

Course Description: A course combining didactic lectures
and a hands-on workshop to expose participants to the
endoscopic management of pediatric craniosynostosis.
Didactic lectures will review patient selection, surgical
techniques, outcomes, and complications. The hands-on
workshop will review instrumentation, endoscopic, and
surgical techniques using 3D models.

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

- › Describe the surgical techniques used in pediatric endoscopic craniosynostosis surgery.
- › Summarize the clinical indications and outcomes for the endoscopic treatment of infants with craniosynostosis.
- › Discuss the management of complications that may occur with endoscopic craniosynostosis surgery.

SF 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

NEW

PC06 Update on Movement Disorders: Case Based Review of Approaches and Controversies

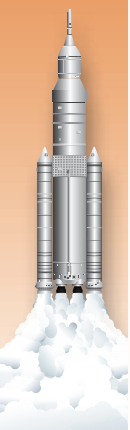
Course Directors: Ellen L. Air, Francisco A. Ponce

Faculty: Ron L. Alterman, Kim J. Burchiel, Alexandre N.
Francisco, Casey H. Halpern, Clement Hamani, Peter Konrad,
Ashwin Viswanathan

Course Description: The course will utilize a case-based
approach to understanding the latest emerging and
alternative approaches to performing deep brain stimulation
surgery to maximize outcomes and patient comfort.

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

- › Explain the difference in outcomes for each target used for deep brain stimulation and identify the appropriate target for each individual case.
- › Review drawbacks, limitations, and advantages of awake versus “asleep” deep brain stimulation iSF implantation.
- › Describe the role of MR guided focused ultrasound in the management of movement disorders.



TU 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

NEW**PC07 Modern Applications of Radiosurgery**

Course Director: Steven D. Chang

Faculty: John R. Adler, Clark C. Chen, Jason P. Sheehan

Course Description: This course will feature leading surgeons in the field of radiosurgery who will discuss the current and emerging strategies for the use of radiosurgery in neurosurgery patients. Participants should expect to finish the course with a current understanding of standard and emerging treatment strategies available for neurosurgeons using different radiosurgery devices.

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

- › Explain what radiosurgery is, and what different radiosurgery devices are, as well as their advantages and disadvantages.
- › Identify appropriate diseases that can be treated with radiosurgery.
- › Apply existing evidence for radiosurgery.

8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

NEW**PC08 WINS Practical Course on Leadership and Education**

Course Directors: Jennifer A. Sweet, Sarah Woodrow

Faculty: Pamela S. Jones, Alan M. Scarrow, Nathan R. Selden, Warren R. Selman, Stacey Q. Wolfe

Course Description: This course is directed at academic faculty, program directors, program chairs, and senior level residents or fellows interested in pursuing academic careers. Leaders in academic neurosurgery face many pressures including running programs with limited resources, having expectations for results, training future leaders in the field, and managing complex team dynamics. These challenges, combined with differences in ideas, perceptions, and priorities often create environments in which individuals are operating below their capabilities. Learning the critical skills of leadership, mentorship, emotional intelligence, milestones, assessment measures, team-building, and balance can enhance the likelihood of success in a changing environment. Through interactive presentations, experiential exercises, and peer-to-peer discussions, participants will discover practical strategies for leadership in education that include enhanced diversity awareness, to create a training program of excellence.

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

- › Define expectations and success factors of leadership.
- › Identify the importance of mentorship and how to be a good mentor.
- › Know the value of assessment measures and science to incorporate into your training programs.
- › Describe the role of emotional intelligence in leading yourself and others in this increasingly diverse landscape.
- › Apply strategies for managing time and setting priorities that result in the achievement of both personal and organizational goals.

TU 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

PC09 3D Surgical Neuroanatomy (Supratentorial)

Course Director: Juan C. Fernandez-Miranda

Faculty: Emel Avci, Mustafa K. Baskaya, Spiros L. Blackburn, Evandro De Oliveira, Pablo A. Rubino

Course Description: This course will review 3D surgical neuroanatomy relevant for safe and effective resection

of infratentorial tumor lesions. The areas to cover will be cerebellum, fourth ventricle, cerebello-pontine angle, pineal and posterior incisural region, clival, petroclival, and foramen magnum region. Master surgeons will illustrate the importance of surgical neuroanatomy with HD/3D video illustrations of surgical approaches including telo-velar, supracerebellar, transtentorial, retrosigmoid, presigmoid, transcondylar, and endoscopic endonasal transclival.

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

- › Review the intricate 3D anatomy of the fiber tracts as required for treatment of complex intrinsic lesions.
- › Identify the key surgical anatomy for paralimbic region and intraventricular tumors and demonstrate its clinical application with illustrative cases.
- › Describe the surgical anatomy and different routes through the anterior skull base, middle fossa, and cavernous sinus, including endoscopic endonasal and trancranial approaches.

SE 12:30–4:00 pm \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

NEW**PC10 Innovation, Quality, and Safety—A Balance Along the Continuum of Care for Neurosurgical Patients**

Course Directors: Mohamad Bydon, Clemens M. Schirmer

Faculty: Neil A. Martin, J. D. Mocco, J. Adair Prall, Jonathan Slotkin, Gregory H. Smith, Babu G. Welch

Course Description: Health care delivery innovation along the continuum of care involves more than just bundling. Older facets e.g., National Patient Safety Goals can be combined with newer approaches, and cost measures and delivery models piloted by the Center for Medicare/Medicaid Innovation (CMMI). This course gives an overview of neurosurgical involvement along the continuum of care from pre-hospital assessment to post-acute care.

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

- › Define the neurosurgical care pathway and its components.
- › Discuss aspects of patient safety and quality pertinent to neurosurgery.
- › Discuss innovation of care delivery models relevant to neurosurgical patients.

SP 12:30–4:00 pm \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student



CNS

SANS
Lifelong Learning

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

NEW**PC11 Spinal Trauma and Spinal Cord Injury: Case-based Presentations and Future Directions**

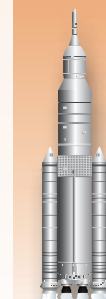
Course Directors: Michael G. Fehlings, James S. Harrop

Faculty: Mohamad Bydon, Gregory W.J. Hawryluk, Paul K. Kim, Allan D. Levi, Patrick R. Pritchard, Jefferson R. Wilson

Course Description: Use case-based learning to describe the diagnosis and treatment of cervical, thoracic and lumbar trauma, and spinal cord injury.

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

- › Discuss techniques and approaches to treat spinal trauma.
- › Identify and avoid common complications associated with treatment of spinal trauma and spinal cord injury.
- › Discuss current research and novel strategies for management of spinal cord injury.



SUBSPECIALTY SESSION TRACK KEY

AP Advanced Practice Provider

PA Pain

RE Resident

SF Stereotactic and Functional

TR Neurotrauma

CV Cerebrovascular

PE Pediatric

SE Socioeconomic

SP Spine and Peripheral Nerves

TU Tumor

SP 12:30–4:00 pm \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

NEW**PC12 My Worst Spinal Complication: What I Learned**

Course Directors: Daniel K. Resnick, Luis M. Tumialan

Faculty: Mark H. Bilsky, Michael W. Groff, J. Patrick Johnson, Shekar N. Kurpad, Matthew J. McGirt, Vedantam Rajshekhar, Michael Y. Wang, Eric J. Woodard

Course Description: In this course, faculty will discuss case examples of challenging spine surgical complications with a special focus on pearls and pitfalls for complication avoidance and management.

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

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

RE SP 12:30–4:00 pm \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

PC13 Peripheral Nerve Surgery: Techniques and Exposure

Course Directors: Rajiv Midha, Robert J. Spinner

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

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

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

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

TU 12:30–4:00 pm \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

PC14 3D Surgical Neuroanatomy (Infratentorial)

Course Director: Juan C. Fernandez-Miranda

Faculty: Vladimir Benes, Aaron A. Cohen-Gadol, Jeffrey M. Sorenson, Necmettin Tanriover, Ugur Ture

Course Description: This course will review relevant surgical neuroanatomy using 3D stereoscopic projection. The areas to cover will be cortical and white matter anatomy, cerebrovascular, and skull base anatomy. Master surgeons will illustrate the importance of surgical neuroanatomy for clinical practice with surgical cases and HD/3D video illustrations. There will be an emphasis both in intricate anatomical regions such as insular, ventricles, and cavernous sinus, and newest techniques such as high-definition fiber tractography (HDFT) planning for intrinsic tumor surgery and endoscopic endonasal techniques for skull base lesions. The session will also cover cerebellum and fourth ventricle,

posterior circulation, and lateral and posterior skull base approaches. Master surgeons will illustrate the importance of surgical neuroanatomy for clinical practice with surgical cases and HD/3D video illustrations. Surgical approaches to the cerebello-pontine angle, clival and petroclival region, jugular foramen, and foramen magnum will be discussed both from transcranial (retrosigmoid, anterior and posterior transpetrosal, suboccipital transcondylar) and endoscopic endonasal routes.

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

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

SE 12:30–4:00 pm \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

NEW**PC15 Neurosurgeon-hospital Relationships: Options, Negotiations, and Achieving What You Are Worth**

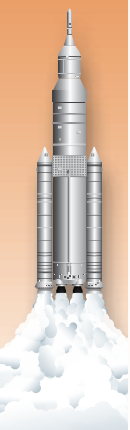
Course Directors: Dong H. Kim, Ann R. Stroink

Faculty: Deborah L. Benzil, John J. Knightly, Robert E. Harbaugh, Edie E. Zusman

Course Description: This course will cover the major changes occurring in the US health care 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 that define what is and is not possible? What makes an opportunity attractive now, and how can one determine viability in the future? This course will review macro-level changes coupled with faculty that can provide concrete examples from real-world experience of individuals and groups that conducted successful negotiations and established new working relationships.

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

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



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

DINNER SEMINAR 1

DIN1: The Bottom Line in a Changing World—Updates about CPT, ICD-10, MIPS, and Bundling

Moderators: John K. Ratliff, Clemens M. Schirmer

Faculty: Atman Desai, Philip W. Tally, Luis M. Tumialan

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

- Discuss the basics of CPT coding and how various codes are selected for specific cases.
- Summarize the update on new CPT codes recently passed for 2018.
- Implement these coding changes in their own practices to insure accuracy and reimbursement.
 - 4–Discuss the impact of MACRA/MIPS and the new Quality Payment Program.
- Appreciate the potential impact of bundled payments.
- Discuss the impact of ICD-10 implementation.
- Apply these lessons to the implementation of ICD-10 in their own practices.

III Forks

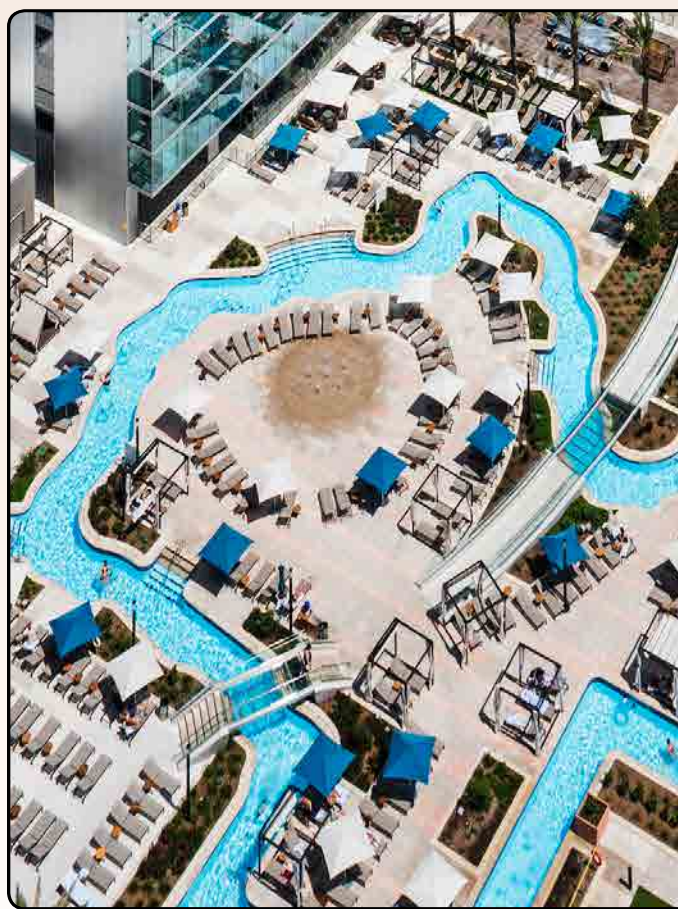
Located in the heart of downtown, III Forks Steakhouse Houston is a contemporary take on a classic upscale steakhouse. The restaurant features a lively bar and lounge area with menu items such as USDA Prime beef, ocean-fresh seafood, and lighter, local favorites. Upon entering the front door, the foyer welcomes guests with an array of over 1,500 fine wines from the spectacular glass wine room.

Open Table awarded III Forks the Diners' Choice Award in 2018.

Complimentary shuttle service will depart from the Marriott Marquis Houston at 6:15 pm.



DINNER SEMINAR



Saturday, October 6 | 5:00–6:30 pm

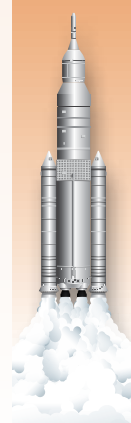
INTERNATIONAL RECEPTION

Marriott Marquis Houston

Join your colleagues from around the world at the 2018 International Reception. Enjoy hors d'oeuvres and cocktails while chatting with some of the top international professionals in the field of neurological surgery. All international attendees and their registered guests are invited to attend.

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

Texas-shaped rooftop pool at the Marriott Marquis Houston



OCTOBER

7

SUNDAY

PROGRAM HIGHLIGHTS

8:00 am-4:00 pm

SYM2 Surgical Robotics: Engineering to Bedside



6:03-6:30 pm

SPECIAL LECTURE
A Conversation with Al Unser Jr.
The Nervous System at 220 MPH!

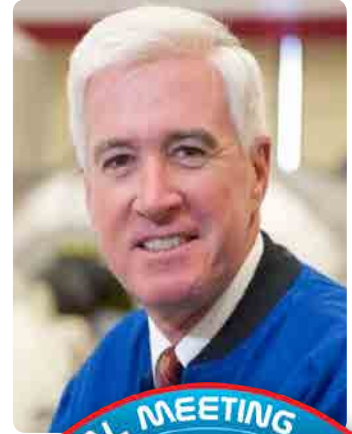
Al Unser Jr.



4:41-5:03 pm

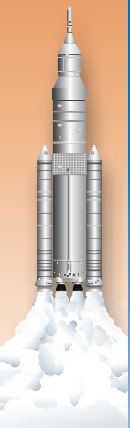
SPECIAL LECTURE
Space Medicine, Terrestrial Applications for Human Health, Performance, and Longevity

Smith L. Johnston III



6:30-8:30 pm

OPENING RECEPTION



8:00 am–4:00 pm \$300 Physician, \$200 Nurse/NP/PA, \$100 Resident/Medical Student, \$200 Engineer, \$550 Corporate/Industry Representative

SYM2 Surgical Robotics: Engineering to Bedside*

Course Directors: Michael R. Raber, Chengyuan Wu

Speakers: Monty Barlow, Sarat P. Chandra, Louis Chenin, Jorge A. Gonzalez-Martinez, Amy Kerdok, Serge Roux, Garnette Sutherland, Nicholas Theodore, Melanie Turieo, David P. Vansickle, Christopher R. Wagner, Michael Y. Wang, Robert Webster III

Course Description: Advances in the quality and availability of 3D anatomic imaging in combination with maturing robotics technology has resulted in several robotic systems on the market that support a range of cranial and spinal surgery procedures. This symposium will provide information on the state-of-the-art in robotics, allowing participants to understand and evaluate current and upcoming systems for cranial stereotaxy, endoscopy, and spinal instrumentation. A key focus is to provide a foundational understanding of robotic systems in the context of clinical benefit so participants will have a framework to make educated assessments regarding tradeoffs between features and performance of current and upcoming systems. Building upon this foundation, the future of robotics in neurosurgery will also be discussed. Didactic sessions will be supplemented by a series of breakout sessions where participants will have an opportunity to interact firsthand with current robotic systems and discuss usage with surgeons who have used the systems in clinical practice.

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

- Explain the potential benefits of image-guided robotics as distinct from current image-guided (non-robotic) neurosurgery and spinal surgery procedures, including cranial stereotaxy, endoscopy, and spinal instrumentation.
- List the features, workflows, benefits, and drawbacks of the available robotic systems for neurosurgery and spinal surgery.
- Review the current state of evidence-based support for robotic systems.
- Identify the key technology features of image-guided robotic systems to enable a principled assessment of future robotic systems.
- Review upcoming developments in the field of medical robotics to understand clinical trends and potential benefits.

8:00–9:00 am

Didactic Session 1: Background/History of Surgical Robotics

8:00–8:10 am

Welcome and Introductory Remarks

Michael R. Raber,
Chengyuan Wu

8:10–8:30 am

Image-guided Robotics for Neurosurgery

Garnette Sutherland

8:30–8:50 am

Minimally Invasive Surgical Robotics—Past and Future

Amy Kerdok

8:50 am–9:00 am

Historical Trends in Surgical Tools—From Manual to Robotic

Panel Discussion

9:00–9:30 am

Morning Breakout Session with Corporate Sponsor

9:30–10:30 am

Didactic Session 2: Spine Applications of Robotics

9:30–9:45 am

Applications of Robotics in Spine Surgery and Spine Surgery Training

Michael Y. Wang

9:45–10:00 am

Robotic Development to Fit the Unique Needs of Spine Surgery

Nicholas Theodore

10:00–10:15 am

Screw Placement Accuracy Using Robotic Assistance and Intraoperative Fluoroscopy

Louis Chenin

10:15–10:30 am

Current and Future State of Robotics in Spine Surgery

Panel Discussion

10:30–11:00 am

Morning Breakout Session with Corporate Sponsor

11:00 am–12:00 pm

Didactic Session 3: Cranial Neurosurgery Applications of Robotics

11:00–11:15 am

Robotic Applications in Deep Brain Stimulation

David P. Vansickle

11:15–11:30 am

Robotic Applications in Epilepsy

Jorge A. Gonzalez-Martinez
Martinez

11:30–11:45 am

Endoscopy and Robotics

Sarat P. Chandra

11:45 am–12:00 pm

The Current and Future State of Robotics in Cranial Neurosurgery

Panel Discussion

12:00–1:00 pm

Lunch and Breakout Session with Corporate Sponsor

1:00 – 2:00 pm

Didactic Session 4: Evaluation and Assessment of Current Technology

1:00–1:25 pm

Efficiency and Accuracy Trade-offs in Current Robotic Systems

(Non-CME Talk)
Christopher R. Wagner

1:25–1:45 pm

Pre-operative Setup and Intraoperative Workflow Considerations for Current Robotic Systems

Melanie Turieo

1:45–2:00 pm

Clinical Needs and Engineering Trade-offs in Today's Cranial and Spine Robots

Panel Discussion

2:00–2:30 pm

Afternoon Breakout Session with Corporate Sponsor

2:30–3:30 pm

Didactic Session 5: Future Directions

2:30–2:45 pm

Advances in Minimally Invasive Robotics for Neurosurgery

Robert Webster III

2:45–3:00 pm

Artificial Intelligence for Pre-operative Planning Support and Post-operative Analysis

Joe Corrigan

3:00–3:15 pm

Next Generation User Interfaces for Spine Surgery

Serge Roux

3:15–3:30 pm

Key Emerging Technology for Robot Enhanced Neurosurgery

Panel Discussion

3:30–4:00 pm

Questions and Discussion

Presented in collaboration with



*This is a non-CME symposium



AP 8:00 am–4:00 pm Complimentary to registered ANSPA members, Nurse/PA registrants

PC16 Association of Neurosurgical Physician Assistants (ANSPA) Fall 2018 CME Meeting Presented in Collaboration with Congress of Neurological Surgeons (CNS)

Course Director: Grace H. Bryan

Course Description: This course is specifically designed by the Association of Neurosurgical Physician Assistants for Physician Assistants and Nurse Practitioners that are practicing or interested in neurosurgery.

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

- › Identify and discuss diagnoses and treatment options related to neurosurgical pathology.
- › Conduct patient workup to diagnose and treat patients with neurosurgery-related conditions.
- › Demonstrate application of neurosurgical principles in advanced practitioner practice of patient triage and treatment.

CV 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

NEW

PC17 New Era in Stenting

Course Director: Andrew W. Grande

Faculty: Felipe Albuquerque, Adam S. Arthur, George de Albuquerque Mendes, Brian T. Jankowitz, Demetrius K. Lopes, Orlando Maia, Adnan H. Siddiqui, Raymond D. Turner, Henry H. Woo

Course Description: The next generation of intra-cranial stents continues to increase the number, shape, and type of cerebral aneurysms that can be treated endovascularly. During this course, neurosurgeons will be introduced to the latest approved devices and allowed to practice deploying them.

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

- › Review the indications for placement of pulse rider, barrel stent, LVIS, LVIS Jr., Atlas, and venous stents.
- › Describe the technical tips for placement of pulse rider, barrel stent, LVIS, LVIS Jr., Atlas, and venous stents.
- › Practice deploying stents on simulators.

SE 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

NEW

PC18 CPT Update

Course Directors: John K. Ratliff, Henry H. Woo,

Faculty: Joseph S. Cheng, Atman Desai, Kim Pollock, Clemens M. Schirmer, Luis M. Tumialan

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 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

PC19 Spinal Biomechanics in Modern Clinical Practice

Course Directors: Joseph S. Cheng, Tyler R. Koski

Faculty: Ricardo V. Botelho, Aruna Ganju, Ajit A. Krishnaney, Christopher M. Maulucci, Zachary A. Smith, Gregory R. Trost, Michael S. Virk, Rishi K. Wadhwa

Course Description: Evaluate the impact of biomechanics on spine surgery ranging from degenerative to trauma to deformity.

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

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

SP 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

NEW

PC20 Thoracolumbar Spinal Deformity for the Non-deformity Spine Surgeon

Course Directors: Dean Chou, Paul Park

Faculty: Ian G. Dorward, Kai-Ming G. Fu, D. Kojo Hamilton, Praveen V. Mummaneni, Lee A. Tan

Course Description: This course will use case-based learning to describe the diagnosis and treatment of thoracolumbar deformity, including pearls for complication avoidance.

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

- › Describe appropriate measures for diagnosis and classification of thoracolumbar spinal deformity.
- › Describe surgical approaches and techniques for correction of thoracolumbar spinal deformity.
- › Discuss common complications and management strategies for thoracolumbar deformity surgery

PA 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

PC21 Neurosurgical Treatment of Chronic Headache

Course Director: Jason M. Schwalb

Faculty: Mark Burish, Cormac O. Maher, Sean J. Nagel, Wouter I. Schievink, Konstantin V. Slavin

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

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

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

SUBSPECIALTY SESSION TRACK KEY

AP Advanced Practice Provider

PA Pain

RE Resident

SF Stereotactic and Functional

TR Neurotrauma

CV Cerebrovascular

PE Pediatric

SE Socioeconomic

SP Spine and Peripheral Nerves

TU Tumor

SF 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student



SANS
Lifelong Learning

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

NEW

PC22 Review of Functional Neurosurgery for the Non-specialist

Course Directors: Sharona Ben-Haim, Jennifer A. Sweet
Faculty: Ellen L. Air, Vanessa M. Holanda, Paul A. House, Roy S. Hwang, Andre Machado, Charles B. Mikell, Nader Pouratian
Course Description: The course will review anatomy relevant to functional neurosurgery and outline how to incorporate functional procedures into non-functional neurosurgery practices.

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

- › Describe functional neuroanatomy of the brain and its relationship to key procedures in functional neurosurgery, including neuromodulation and neuroablation.
- › List common disorders that can be effectively treated or cured by functional neurosurgery procedures.
- › Outline which functional neurosurgery procedures can be performed in a practice not exclusively devoted to functional neurosurgery and how this capacity can be developed.

TU 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

PC23 Surgical Management of Eloquent Area Tumors: Functional Mapping and/or Navigation

Course Director: Shawn L. Hervey-Jumper
Faculty: Lorenzo Bello, Hugues Duffau, Jason Heth, Jose M. Rotta, 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.

TU 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

PC24 Brain Tumor Update Part 1: Malignant Brain Tumors

Course Directors: Manish K. Aghi, Andrew E. Sloan
Faculty: Orin Bloch, Michael Lim, Nader Sanai, Jeffrey S. Weinberg

Course Description: This course will review standard-of-care guidelines in the management of malignant brain tumors, followed by a discussion and demonstration of innovative techniques that may become standard-of-care in the future. Attendees will have an opportunity to view and practice various techniques at vendor-sponsored booths.

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

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

TR 8:00–11:30 am \$450 Physician, \$300 Nurse/NP/PA, \$125 Resident/Medical Student

NEW

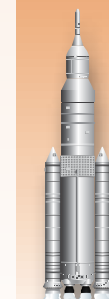
PC25 Concussion: Advances in Mild Trauma Brain Injury Science

Course Directors: Julian E. Bailes, Uzma Samadani
Faculty: Maya A. Babu, Rebekah Mannix, Joseph C. Maroon, Christina L. Master

Course Description: This course will focus on the epidemiology, diagnosis, and treatment of both sports- and non-sports-related concussion. We will examine the impact of the growing number of pediatric and adult concussion diagnoses in society and review standard management of these injuries. Novel diagnostic tools and emerging therapies for concussion, including promising pharmacological agents, will be discussed.

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

- › Apply new concepts to the historical definition of concussion.
- › Recognize the multidisciplinary nature of concussion care.
- › Relate new technologies to help the diagnosis and treatment concussions.



AP RE 12:30–4:00 pm

\$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

NEW
PC26 Big Data—Core Principles of Data Science for Neurosurgeons

Course Directors: Lola B. Chambless, Nader Pouratian
Faculty: Dallin Akagi, Genevera Allen, Sandi Lam, Bennett Landman, John F. Magnotti, Eric K. Oermann, Clemens M. Schirmer, Timothy R. Smith

Course Description: Data science is a rapidly evolving field that impacts neurosurgeons in every aspect of their careers by changing the way scientific discoveries are made and health care is delivered. In this course, a diverse group of speakers with backgrounds in neurosurgery, statistics, imaging, and industry will provide a framework to understand how advanced data science techniques can be employed to improve study design, patient outcomes, and practice management.

- Learning Objectives:** Upon completion of this course, participants will be able to:
- Identify common data science strategies, resources, and databases useful for health care practitioners.
 - Define key terms including “natural language processing,” “machine learning,” “radiomics,” and “artificial intelligence.”
 - Explore solutions to a problem in a large-sample data set in a workshop format.
 - Learn how to use pooled neurosurgical practice data to enhance individual practice management.
 - Identify methods of collaborating with industry and scientific partners to solve neurosurgical research questions using advanced data science techniques.

TU 12:30–4:00 pm \$450 Physician, \$300 Nurse/NP/PA,
\$125 Resident/Medical Student

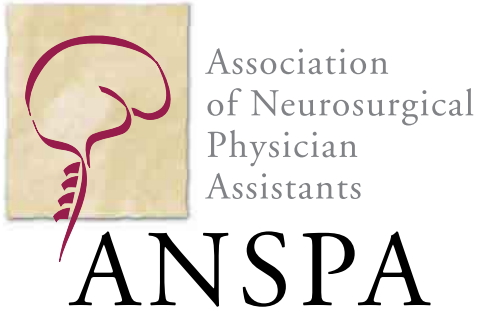
PC27 Brain Tumor Update Part 2: Benign Brain Tumors

Course Directors: Randy L. Jensen, Isaac Yang
Faculty: Jeffrey N. Bruce, Daniel P. Cahill, Ricardo J. Komotar, Mark E. Linskey, Ramesh C. Mishra, Allen Waziri

Course Description: This course will discuss the appropriate use of radiosurgery and surgery for benign central and peripheral nervous tumors.

- Learning Objectives:** Upon completion of this course, participants will be able to:
- Discuss contemporary management of benign tumors by microsurgery and endoscopy.
 - Review contemporary management of benign tumors by radiosurgery.
 - Detail contemporary management of specific tumor histologies, including skull base meningiomas, pituitary adenomas, acoustic neuromas, chordomas, peripheral nerve tumors, and pediatric tumors.
 - Apply these treatment strategies or refer appropriate patients in their practice for surgery or radiosurgery therapy.

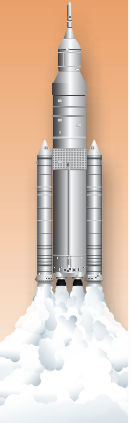
1:00–3:00 pm
CNS Resident SANS Challenge Preliminary Round

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

Sunday, October 7 | 8:00 am–4:00 pm

The ANSPA Annual CME Meeting is created specifically for PAs and NPs working in, or interested in, neurosurgery.



4:30–6:30 pm Texas Ballroom at the Marriott Marquis Houston

GENERAL SCIENTIFIC SESSION I: Technology as a Means of Enhancing Human Performance

Presiding Officer: Ashwini D. Sharan

Moderators: Brian L. Hoh, Alexander A. Khalessi

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

- › Review surgical indications and published data regarding endoscopic evacuation of intracerebral hemorrhage.
- › Identify technologies and current state-of-the-art in brain-machine interface research.
- › Review the application of robotic technology to support the placement of spinal instrumentation and implant limitations.

4:30–4:33 pm

Opening Remarks, Introduction, and Disclosures

Ashwini D. Sharan

4:33–4:38 pm

Executive Committee and Annual Meeting Committee Acknowledgements

Ashwini D. Sharan

4:38–4:41 pm

Introduction of Smith Johnston

Mark N. Hadley

5:03–5:18 pm

The Role of Surgery in the Management of Intracerebral Hemorrhage

Daniel L. Barrow

5:18–5:33 pm

Brain Machine Interfaces for Restoration of Communication and Motor Function

Jaimie M. Henderson

5:33–5:39 pm

Neurosurgery Tumor Paper of the Year

5:39–5:45 pm

Neurosurgery Neurotrauma and Critical Care Paper of the Year

5:45–6:00 pm

Robotics in Spinal Surgery: Fad or Frontier

Nicholas Theodore


6:00–6:03 pm

Introduction of Al Unser Jr.

Michael C. Cawley



4:41–5:03 pm
Special Lecture
Space Medicine, Terrestrial Applications for Human Health, Performance, and Longevity
Smith L. Johnston III, MD, MS




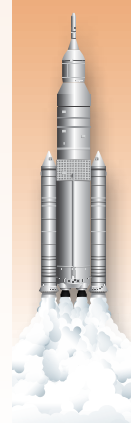
6:03–6:30 pm
Special Lecture
A Conversation with Al Unser Jr., the Nervous System at 220 MPH!
Al Unser Jr.
Moderators: Michael C. Cawley, Christopher E. Wolfla

Join us at the
OPENING RECEPTION

Sunday, October 7
6:30–8:30 pm

Marriott Marquis Hotel

Kick off your Annual Meeting with a stellar reception at the Marriott Marquis Houston. Join your colleagues and friends over hors d'oeuvres, cocktails, and entertainment.

OCTOBER

8

MONDAY

PROGRAM HIGHLIGHTS

7:00-8:30 am

Guidelines for Acute Cervical and Thoracolumbar Spine Trauma



11:50 am-12:15 pm

**WALTER E. DANDY ORATION
A Conversation with Laird Hamilton:
Risk, Reward, and Overcoming Fear**



9:23-9:45 am

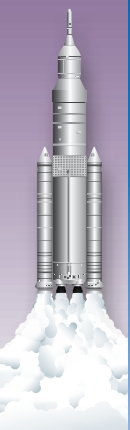
**HONORED GUEST PRESENTATION
The Neurosurgeon as a Stroke
Specialist**

Robert H. Rosenwasser



4:15-6:15 pm

**Case-based
Discussion
Sessions**



SP 7:00–8:30 am

Guidelines for Acute Cervical and Thoracolumbar Spine Trauma

Moderator: John E. O'Toole

Speakers: Bizhan Aarabi, Paul M. Arnold, John H. Chi, Daniel J. Hoh, R. John Hurlbert, John E. O'Toole, Patricia B. Raksin, Nicholas Theodore

Course Description: This seminar will assess the existing evidence-based guidelines for the management of acute cervical and thoracolumbar spine trauma and explore concepts regarding evaluation, treatment, and protocols as they relate to patient outcome.

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

- › Identify advances in the medical and surgical treatment of traumatic cervical and thoracolumbar spinal injury.
- › Assess current evidence-based medicine literature on the diagnosis and treatment of traumatic cervical and thoracolumbar spinal injury.
- › Describe protocols for diagnosis and treatment of cervical and thoracolumbar spine injury

7:00–7:09 am

Introduction to Guidelines: Purpose and Practicality

John E. O'Toole

7:09–7:18 am

Hemodynamics and Spinal Cord Perfusion in SCI

Daniel J. Hoh

7:18–7:27 am

Pharmacologic Treatment of Acute Spinal Cord Injury

R. John Hurlbert

7:27–7:36 am

Timing of Surgical Intervention in Spine Trauma

Paul M. Arnold

7:36–7:45 am

Management of Injuries of the Craniocervical Junction

Nicholas Theodore

7:45–7:54 am

Management of Subaxial Cervical Spine Injuries

Bizhan Aarabi

7:54–8:03 am

Diagnosis and Classification of Thoracolumbar Spine Injury

Patricia B. Raksin

8:03–8:12 am

Management of Thoracolumbar Spine Injuries

Daniel J. Hoh

8:12–8:21 am

Unique Surgical Strategies for Thoracolumbar Spine Fractures

John H. Chi

8:21–8:30 am

Questions and Discussion

7:00–8:30 am

SUNRISE SCIENCE AND LATE BREAKING ABSTRACT SESSIONS

For a listing of Sunrise Science oral presentations, please see pages 70-73.

Learning Objectives:

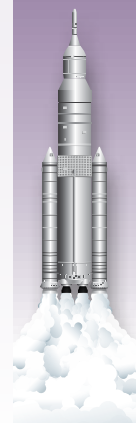
- › Analyze the findings of novel neurosurgical studies, critique the design and methodology.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Apply lessons of ongoing research to neurosurgical care of patients.

TU Sunrise Session and Late Breaking Abstract Session 1

Moderators: Pamela S. Jone, Brian V. Nahed

CV Sunrise Session and Late Breaking Abstract Session 2

Moderators: Mark D. Bain, Michael R. Levitt, Eric C. Peterson



MISSION CONTROL: THE CNS EXHIBIT HALL

The hub where it all happens.

The CNS Exhibit Hall is the place to get hands-on with bold new technology and discover the latest advances from our corporate partners. With more than 150 companies in attendance, the Exhibit Hall is the most efficient way to find and compare devices and other technologies for your neurosurgical practice.



IN-BOOTH DEMONSTRATIONS. See how some of the leading subspecialty experts utilize that technology in their practice and try new devices out for yourself.



VISIT THE PRESENTATION STAGE during your morning and afternoon breaks. Every morning, surgeons from top institutions across the US will operate live via telemedicine between 10:00-10:30 am.



Afternoons from 1:45-2:45 pm, look for Educational Update Sessions: Quick 10-minute talks that fill you in on the latest from industry leaders, an FDA Session, and more.



Join CNS's top corporate partners each day for a complimentary lunch-and-learn session covering important clinical topics. Choose one daily, from 12:15-1:45 pm.

MAKE TIME FOR THE CNS XPERIENCE LOUNGE, where you can find all of your CNS needs in one place!



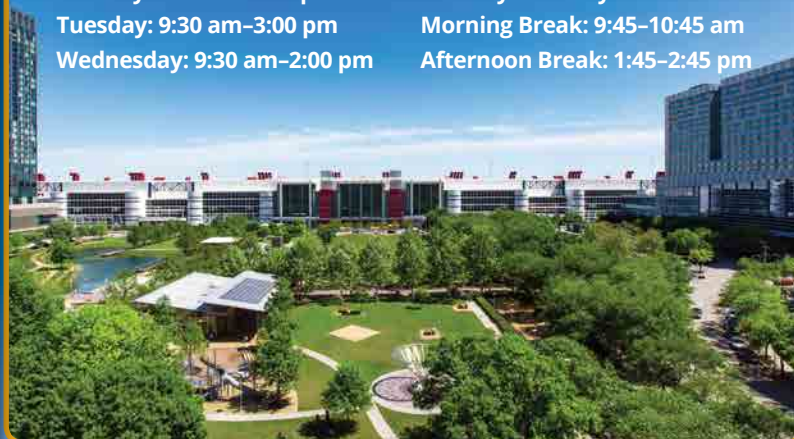
BEST TIMES TO VISIT THE HALL

EXHIBIT HALL HOURS

Monday: 9:30 am-4:00 pm
Tuesday: 9:30 am-3:00 pm
Wednesday: 9:30 am-2:00 pm

EXHIBIT HALL BREAKS

Monday-Tuesday
Morning Break: 9:45-10:45 am
Afternoon Break: 1:45-2:45 pm



8:45 am–12:15 pm

GENERAL SCIENTIFIC SESSION II: Neurosurgeon as Hero

Presiding Officer: Ganesh Rao

Moderators: Nicholas C. Bambakidis, Nader Pouratian

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

- › Discuss the existing data supporting stem cell implantation for cortical stroke recovery.
- › Identify intrinsic brain tumor patients who may be candidates for immunotherapy.
- › Review the progress in minimally invasive surgical approaches for spinal deformity.

8:45–8:48 am

Introductions and Disclosures

Ganesh Rao

8:48–8:58 am

Middle Meningeal Artery Embolization for Subdural Hematoma

Jared Knopman

8:58–9:08 am

The Evolution of Less Invasive Adult Deformity Surgery

Michael Y. Wang

9:08–9:18 am

Stem Cell Therapy for Stroke

Gary K. Steinberg

9:18–9:23 am

Introduction of Honored Guest

James S. Harrop



9:23–9:45 am

Honored Guest

The Neurosurgeon as a Stroke Specialist

Robert H. Rosenwasser

9:45–10:45 am

Morning Beverage Break

Visit the Exhibit Hall

10:00–10:30 am

Live Surgery in the Exhibit HallSponsored by **Canon**
CANON MEDICAL SYSTEMS USA, INC.

10:51–11:01 am

Nexus Presentation

Nicholas C. Bambakidis, Peter Nakaji

11:01–11:07 am

CNS RESIDENT AWARD PRESENTATION**Towards the Co-clinical Glioblastoma Treatment Paradigm—Radiomic****Machine Learning Identifies****Glioblastoma Gene Expression****in Patients and Corresponding****Xenograft Tumor Models**

Pascal O. Zinn

11:07–11:13 am

K12/GETCH AWARD**Amygdala Inhibits Breathing in****Humans—Understanding How****Seizure Spread to the Amygdala****Causes Apnea and Sudden****Unexpected Death in Epilepsy**

Brian J. Dlouhy

11:13–11:16 am

Introduction of CNS President

Ali R. Rezai



11:16–11:41 am

Presidential Address

Ashwini D. Sharan

11:41–11:47 am

Neurosurgery Top Paper of the Year, Pain Paper of the Year, and Spine and Peripheral Nerve Paper of the Year

11:47–11:50 am

Introduction of Dandy Orator Michael

L. Levy, Gerald E. Rodts Jr.



11:50 am–12:15 pm

Walter E. Dandy Oration

A Conversation with

Laird Hamilton:

Risk, Reward, and

Overcoming Fear

Laird Hamilton

Moderators: Michael

L. Levy, Gerald E.

Rodts Jr.



12:15–1:45 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).

RE

M01 Honored Guest Luncheon: The Business of Medicine in the 21st Century—Pearls and Pitfalls

Complimentary for CNS Resident and International Vista Resident members!

Speaker: Robert F. Heary

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

- › Translate the evolution of neurovascular technology in the treatment of hemorrhagic stroke.
- › Identify the steps in academic neurosurgery career development.
- › Recognize the importance of systems and processes of care in organizing neurosurgical care delivery.

SE

M02 Navigating MACRA/MIPS and Bundled Payments

Moderator: Paul L. Penar

Faculty: Rachel Groman, Keith R. Kuhlengel, Sandi Lam, Jonathan Slotkin

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

- › Describe the components of the MACRA legislation pertinent to neurosurgeons.
- › Comprehend the choices involved when choosing one of the different penalty programs.
- › Share this information with their practices and implement their optimal choice going forward.
- › Learn about the challenges of implementing a “spine bundle” into clinical practice.

CV

M03 Is Intracerebral Hemorrhage a Surgical Disease?

Moderator: Daniel L. Barrow

Faculty: Abel Po-Hao Huang, Christopher P. Kellner, Gustavo Pradilla, Alejandro M. Spiotta

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

- › Learn the current status of multiple trials using new technology to evacuate deep clots with minimal brain disruption.
- › Identify new indications for clot removal.

CV

M04 Venous Stenting for Pseudotumor

Moderator: Felipe Albuquerque

Faculty: Robert F. James, Michael R. Levitt, Kenneth C. Liu, Kenneth V. Snyder

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

- › Describe the current techniques for quantifying venous outflow insufficiency.
- › Compare and contrast stenting and shunting for ICP treatment.

SP

M05 Controversies in Spinal Deformity Surgery

Moderator: Robert F. Heary

Faculty: Richard G. Fessler, Kai-Ming G. Fu, Lee A. Tan

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

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

SP



CNS

SANS
Lifelong Learning

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

M06 Cervical Spondylotic Myelopathy: Anterior Versus Posterior Approaches

Moderator: Zoher Ghogawala

Faculty: Erica F. Bisson, Perry P.S. Dhaliwal, Asdrubal Falavigna, Iain H. Kalfas, Vincent C. Traynelis, Christopher E. Wolfla

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

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

TR

M07 Management of Chronic Subdural Hematoma

Moderator: Ryan S. Kitagawa

Faculty: Randy S. Bell, Jack Jallo, David O. Okonkwo, Shelly D. Timmons

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

- › Recognize the outcomes of TBI in the elderly.
- › Formulate a plan for surgical and non-surgical treatments of chronic SDH.
- › Explore new technologies that may improve the care of patients with subdural hematoma.

PE

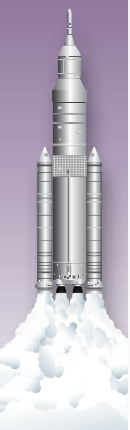
M08 Management of Brachial Plexus Injuries: From Birth to Adult

Moderator: Justin M. Brown

Faculty: Amgad S. Hanna, Michel Kliot, Elias B. Rizk, Brandon G. Rocque, Robert J. Spinner, Lynda Jun-San Yang

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

- › Describe the evaluation and surgical repair of neonatal brachial plexus conditions.
- › Identify the indications for surgical repair of traumatic brachial plexus injuries.
- › Discuss the medico legal consideration associated with the management of brachial plexus pathology.



SUBSPECIALTY SESSION TRACK KEY

AP Advanced Practice Provider

PA Pain

RE Resident

SF Stereotactic and Functional

TR Neurotrauma

CV Cerebrovascular

PE Pediatric

SE Socioeconomic

SP Spine and Peripheral Nerves

TU Tumor

SF

M09 Key Clinical Trials in Epilepsy Surgery

Moderators: Aviva Abosch, Timothy H. Lucas

Faculty: Jorge A. Gonzalez-Martinez, Robert E. Gross, Nitin Tandon

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

- › Identify key trials and levels of evidence for resective epilepsy surgery.
- › Describe relative advantages and evidence supporting neuromodulation procedures, including VNS, DBS, and RNS.
- › Discuss evidence regarding seizure freedom and neurocognitive effects of laser ablation.

TU

M10 Update on Diagnosis and Management of Low Grade Gliomas

Moderator: Brian V. Nahed

Faculty: Ian F. Pollack, Viviane S. Tabar, Nader Sanai

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

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

TU



SANS
Lifelong Learning

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

M11 Acoustic Neuromas: Current Management Strategies

Moderator: Frederick G. Barker

Faculty: Rick A. Friedman, Carl B. Heilman, Steven L. Giannotta, Ricardo Ramina, Marc S. Schwartz

Learning Objectives: Upon completion of this seminar, 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.

1:45-2:45 pm

**Afternoon Beverage Break
Visit the Exhibit Hall**

VISIT CNS CENTRAL

Meet us in the lobby of the George R. Brown Convention Center to register and discover what's happening at the CNS Annual Meeting.



Looking for a specific room or course?
We'll help you find it!

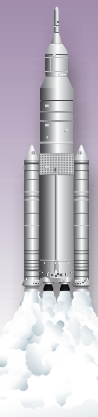
Need help claiming CME?
We'll show you how!

Have a question about membership?
Ask us!

Interested in a ticketed event?
Stop by the registration kiosk!



**THE CONGRESS OF
NEUROLOGICAL SURGEONS
WELCOMES YOU.**



SECTION SESSIONS

SE 2:45–4:15 pm**COUNCIL OF STATE NEUROSURGICAL SOCIETIES**

Moderators: Joshua M. Rosenow, Michael P. Steinmetz

Speakers: Randy S. Bell, Andre Machado, Neil A. Martin, Mark L. Rosenblum

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Discuss updates on military neurosurgery.
- › Discuss the choices between neuroscience centers and departments and other practice types.
- › Review strategies to stay up-to-date in the socioeconomic realm.

2:45–3:10 pm

Mission Neurosurgery—Literally!

Randy S. Bell

3:10–3:15 pm

Questions and Discussion

3:15–3:45 pm

Oral Abstract Presentations

See page 63 for Oral Papers 111-115

3:45–4:15 pm

Panel Discussion— What is the Mission of Neurosurgery in the Framework of Modern Neuroscience Teams?

3:45–3:50 pm

Neil A. Martin

3:50–3:55 pm

Mark L. Rosenblum

3:55–4:00 pm

Andre Machado

4:00–4:15 pm

Panel Discussion

CV 2:45–4:15 pm**SECTION ON CEREBROVASCULAR SURGERY**

Moderators: Joshua W. Osburn, Matthew R. Reynolds

Speakers: J D. Mocco

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Identify the breadth of neurosurgery research.
- › Apply the body of work of the Drake Lecturer.

2:45–3:45 pm

Oral Abstract Presentations

See page 63 for Oral Papers 101-110

3:45–3:50 pm

Introduction of the Drake Lecturer

J D. Mocco

3:50–4:15 pm

Drake Lecture

Elad I. Levy

SP 2:45–4:15 pm**SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES**

Moderator: Daniel J. Hoh

Speakers: Domagoj Coric, Ziya L. Gokaslan, Adam S. Kanter, Daniel C. Lu, Praveen V. Mummaneni, Gerald E. Rodts, Nicholas Theodore, Michael Y. Wang

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

- › Discuss current concepts regarding the management of complex spinal pathologies.
- › Compare various spine surgical treatment strategies with respect to patient outcome.
- › List important areas for further knowledge development and research.

2:45–2:54 pm

TLIF for Degenerative Lumbar Pathology: Case with a Neurological Complication—Avoidance and Treatment

Praveen V. Mummaneni

2:55–3:04 pm

Subaxial Cervical Spine Fracture and Spinal Cord Injury in a Young Patient: Case with a Complication—Avoidance and Treatment

Daniel C. Lu

3:05–3:14 pm

Cervical Arthroplasty Failure Requiring Reoperation: Case and Management Strategies

Domagoj Coric

3:15–3:24 pm

Lateral Approach for Spinal Deformity: Case with a Vascular Complication—Avoidance and Treatment

Adam S. Kanter

3:25–3:34 pm

Complications during MIS TLIF—Avoidance Strategies and Management

Gerald E. Rodts

3:35–3:44 pm

MIS Adult Deformity Case with Complication—Avoidance Strategies and Management

Michael Y. Wang

3:45–3:54 pm

Metastatic Thoracic Spinal Tumor Case with a Complication—Avoidance and Management

Ziya L. Gokaslan

3:55–4:04 pm

Spinal Trauma: TL Junction Trauma Case with a Complication—Avoidance and Treatment

Nicholas Theodore

4:05–4:15 pm

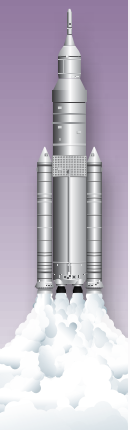
Questions and Discussion**TR** 2:45–4:15 pm**SECTION ON NEUROTRAUMA AND CRITICAL CARE**

Moderators: Kathryn M. Beauchamp, Odette Harris

Speakers: Rodrigo Moreira Faleiro, Karen G. Hirsch, Alan S. Hoffer, Geoffrey T. Manley, Claudia S. Robertson, Allen K. Sills, Lori Shutter

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Formulate end of life plans for victims of severe TBI.
- › Identify the current legal practices associated with end of life care.
- › Interpret the outcomes of patients in a general neurotrauma population.



SUBSPECIALTY SESSION TRACK KEY

AP Advanced Practice Provider

PA Pain

RE Resident

SF Stereotactic and Functional

TR Neurotrauma

CV Cerebrovascular

PE Pediatric

SE Socioeconomic

SP Spine and Peripheral Nerves

TU Tumor

2:45–2:48 pm

Introduction of Marmarou Lecturer

Kathryn M. Beauchamp

2:48–3:18 pm

Marmarou Lecture

Claudia S. Robertson

3:18–3:34 pm

Debate: Should we be Playing Contact Sports?

3:18 - 3:26 pm

Yes

Allen K. Sills

3:26 - 3:34 pm

No

Alan S. Hoffer

3:34–3:50 pm

Debate: Instituting Comfort Measures: Are We Too Early or Too Late?

3:34 - 3:42 pm

Too Early

Karen Hirsch

3:42 - 3:50 pm

Too Late

Lori Shutter

3:50–4:05 pm

Outcomes in Neurotrauma

Geoffrey T. Manley

4:05–4:15 pm

Neurotrauma in Brazil

Rodrigo Moreira Faleiro

PA 2:45–4:15 pm

SECTION ON PAIN

Moderators: Ahmed M.T. Raslan, Ashwin Viswanathan

Speakers: Barbara Evans, Emily L. Levin, Erika A. Petersen

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Identify new technology in neuromodulation.
- › Address ethical concerns of downloadable data.
- › Determine how to integrate downloadable data into one's practice.

2:45–3:33 pm

New Paradigms in Neuromodulation with Downloadable Data

2:45–3:00 pm

Pro—How it can help with Optimization of Therapy and Outcomes

Erika A. Petersen

3:00–3:15 pm

Con—Invasion of Privacy: Big Brother

Emily L. Levin

3:15–3:30 pm

Ethics and Privacy Concerns in Neuromodulation Data

Barbara Evans

3:30–3:33 pm

Questions and Discussion

3:33–4:15 pm

Oral Abstract Presentations

See pages 63-64 for Oral Papers 116-121

PE 2:45–4:15 pm

SECTION ON PEDIATRIC NEUROLOGICAL SURGERY

Moderators: Edward S. Ahn, Elias B. Rizk

Speakers: Anita Mahajan, Arnold Paulino

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Discuss recent scientific advances in pediatric neurosurgery, as presented in the oral abstracts. Describe the indications and complications for the use of radiation modalities in pediatric neurosurgery.
- › Identify the advantages and disadvantages of photon versus proton radiotherapy.

2:45–3:45 pm

Oral Abstract Presentations

See pages 64-65 for Oral Papers 123-132

3:45–4:15 pm

Protons Versus Photons: Updates and Controversies in Pediatric Oncology

3:45–4:00 pm

Pros and Cons of Photon Radiation Therapy

Anita Mahajan

4:00–4:15 pm

Pros and Cons of Proton Beam Radiation Therapy

Arnold Paulino

SF 2:45–4:15 pm

SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY

Moderators: Jonathan Miller, Joshua M. Rosenow

Speakers: Ashesh Mehta, Jonathan Miller, R. Mark Richardson, Daniel Yashor

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Detail the indications and outcomes of resective surgery for epilepsy.
- › Delineate when neuromodulation is a preferred approach over resective surgery and the outcomes of these interventions.
- › Describe differences in outcomes for open versus MR-guided laser ablation for epilepsy.



2:45–3:27 pm

Epilepsy: Resection Versus Neuromodulation Versus Ablation

2:45–2:55 pm

Resection, Ablation, or Modulation: Rational Selection of Surgical Technique in Focal Epilepsy

R. Mark Richardson

2:55–3:05 pm

Epileptic Foci Versus Epileptic Networks: Implications for Surgical Approach

Jonathan Miller

3:05–3:15 pm

Neuromodulation for Epilepsy: Mechanisms and Clinical Results

Daniel Yoshor

3:15–3:25 pm

MR-guided Laser Ablation for Focal Epilepsy: Advantages, Technique, and Complication Avoidance

Ashesh Mehta

3:25–3:27 pm

Questions and Discussion

3:27–4:15 pm

Oral Abstract Presentations

See pages 64-65 for Oral Papers 133-140

TU 2:45–4:15 pm

SECTION ON TUMORS

Moderators: Gordon Li, Michael Lim

Speakers: Frederick G. Barker, Frederick F. Lang, Darryl Lau, Philip V. Theodosopoulos

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies.
- › Critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Review the indications for surgery, radiosurgery, medical therapy versus observation for incidental tumors.
- › Review natural history of incidental tumors.
- › Discuss new and emerging techniques for management of incidental tumors.

2:45–3:30 pm

Contemporary Management and Guidelines for Incidentally Found Tumors

2:45–3:00 pm

Low-grade Gliomas

Frederick F. Lang

3:00–3:15 pm

Meningiomas

Frederick G. Barker

3:15–3:30 pm

Vestibular Schwannomas

Philip V. Theodosopoulos

3:30–3:36 pm

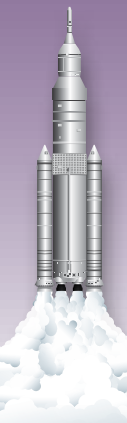
2017-2018 Andrew Parsa Mentorship Award Recipient Talk

Darryl Lau

3:36–4:18 pm

Oral Abstract Presentations

See page 65 for Oral Papers 141-147



CASE-BASED DISCUSSION SESSIONS

Faculty will present cases to be examined, discussed, and debated by both the audience and the panel. Registered attendees are encouraged to submit cases for consideration prior to July 31. Visit cns.org/2018 for details.

SE 4:15–6:15 pm

CASE-BASED DISCUSSION SESSION: Outpatient Neurosurgery: From Office to ASC—Optional or Necessary?

Moderator: Karin R. Swartz

Discussants: James S. Harrop, Carlos Fernando Arias Pesantez, William C. Welch

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

- › List basic neurosurgical procedures that may be amenable to outpatient treatment.
- › Assess limitations and advantages of outpatient treatment.
- › Construct a plan for their own practice assessing whether outpatient treatments are possible.

CV 4:15–6:15 pm

CASE-BASED DISCUSSION SESSION: Treatment of Cerebral Aneurysms

Moderator: Stavropoula I. Tjoumakaris

Discussants: Felipe Albuquerque, Adam S. Arthur, Daniel L. Barrow, H. Hunt Batjer, E. Sander Connolly, Eberval G. Figueiredo, Sean D. Lavine, Robert H. Rosenwasser

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

- › Define the indications for embolization.
- › Define the indications for flow-diversion.
- › Define the indications for clipping.

SP 4:15–6:15 pm

CASE-BASED DISCUSSION SESSION: Spinal Deformity and MIS Surgery

Moderators: Peter D. Angevine, Alfred T. Ogden

Discussants: Ali A. Baaj, Isaac O. Karikari, Tyler R. Koski, Catherine Miller, Paul Park, Charles A. Sansur, Daniel M. Sciubba, Khoi D. Than

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

- › Discuss various treatment options for the management of cervical and thoracolumbar deformity.
- › Describe common complications in cervical and thoracolumbar deformity.
- › Discuss techniques for minimally invasive spine surgery and complication avoidance.

TR 4:15–6:15 pm

CASE-BASED DISCUSSION SESSION: Challenging Cases: TBI

Moderator: Daniel B. Michael

Discussants: Odette Harris, Joshua E. Medow, Craig H. Rabb, Eve C. Tsai, Jamie S. Ullman

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

- › Identify challenging aspects of TBI cases.
- › Employ and prioritize treatments of TBI in the polytrauma patient.
- › Identify emerging treatments to optimize care of TBI patients.

PA 4:15–6:15 pm

CASE-BASED DISCUSSION SESSION: Surgical Techniques in Trigeminal Neuralgia from the Masters

Moderator: Raymond F. Sekula

Discussants: Jeffrey A. Brown, Kim J. Burchiel, Milind S. Deogaonkar, Jun Zhong

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

- › Implement best practices in surgical techniques for facial pain.
- › Describe nuances of each surgical technique.
- › Develop a schema for selecting patients who best benefit for each procedure.

PE 4:15–6:15 pm

CASE-BASED DISCUSSION SESSION: Myelomeningocele and Associated Pathologies: Variable Practice Management

Moderator: Robin M. Bowman

Discussants: Sergio Cavalheiro, Sarah J. Gaskill, Stephanie Greene, Daniel J. Guillaume, William E. Whitehead

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

- › Discuss variations in the management of patients with myelomeningocele.
- › Identify evidence deficiencies in the standard treatment options for the associated pathologies of myelomeningocele.
- › Review the controversies and variable practice associated with the management of myelomeningocele.

SF 4:15–6:15 pm

CASE-BASED DISCUSSION SESSION: The Changing Face of Epilepsy Surgery

Moderators: Jorge A. Gonzalez-Martinez, Guy M. McKhann

Discussants: Arthur Cukiert, Marc Guenot, Bhaskara Rao Malla, Nitin Tandon

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

- › Detail the indications and outcomes of resective surgery for epilepsy.
- › Delineate when neuromodulation is a preferred approach over resective surgery, and the outcomes of these interventions.
- › Describe differences in outcomes for open versus MR-guided laser ablation for epilepsy.

TU 4:15–6:15 pm

CASE-BASED DISCUSSION SESSION: Challenging Tumors

Moderator: Michael A. Vogelbaum

Discussants: Jeffrey N. Bruce, Atul H. Goel, Jose A. Landeiro, Frederick F. Lang, Nader Sanai, Marc S. Schwartz, Theodore H. Schwartz

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

- › Identify common challenges with a variety of cranial procedures.
- › Plan strategies to manage and avoid complication in challenging brain tumors.
- › Apply these treatment strategies and approaches in their own challenging cases.





Great accomplishments come from teams that work to further scientific research.

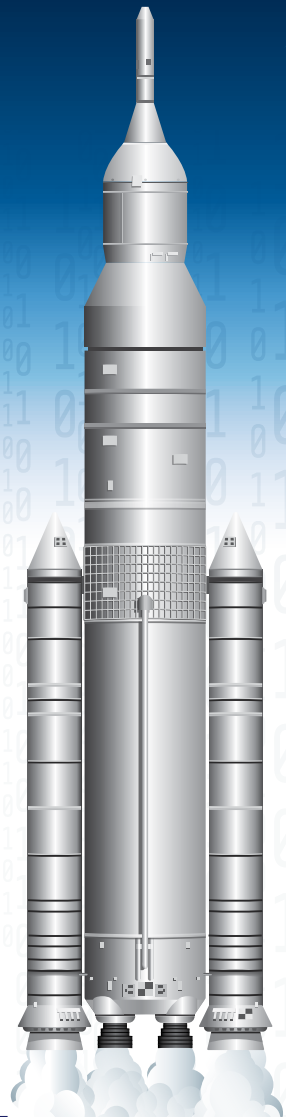
EDITOR-IN-CHIEF ROUNDTABLE

George R. Brown Convention Center
Tuesday, October 9 | 1:00–2:00 pm



Panel members will provide insight into the evaluation and publication process and share their perspective on various subspecialties within neurosurgery. Following the discussion, stay for a Q&A moderated by Editor-in-Chief Dr. Nelson M. Oyesiku, MD, PhD, FACS.

Attendees are highly encouraged to submit questions ahead of time. Address your questions to Managing Editor, Brandon J. Fiedor, at bfiedor@cns.org.



2018 ANNUAL MEETING

HOUSTON, TEXAS
OCTOBER 6-10, 2018

Discover more about the CNS Annual Meeting and register today. CNS.ORG/2018

Advance registration deadline: September 6

 [#2018CNS](https://twitter.com/2018CNS)

CV 7:30–9:30 pm \$190 (includes three-course dinner and beverage)

DIN2: Advances and Controversies in Intracranial AVM Management

Moderators: Gary K. Steinberg
Faculty: Kevin M. Cockroft, Bruce E. Pollock, Yuanli Zhao
Learning Objectives: Upon completion of this seminar, participants will be able to:

- › Review the roles of endovascular embolization, microsurgery, and stereotactic radiosurgery in managing AVMs.
- › Compare rates of obliteration and complications for AVMs in distinct locations, using different treatment modalities.

Vic & Anthony's

Located in downtown Houston, Vic & Anthony's award-winning menu delivers impeccable cuisine and service for the finest steakhouse dining. Preparing only the highest quality USDA Prime Midwest grain fed beef, this sophisticated retreat also features savory appetizers, fresh seafood, and decadent desserts, topped by an exquisite wine list.

Zagat rates Vic & Anthony's as Houston's Most Popular restaurant.

Vic & Anthony's is just a short walk from the Marriott Marquis Houston.



SP 7:30–9:30 pm \$190 (includes three-course dinner and beverage)

DIN3: Robotics and Spinal Surgery: The Future is Now

Moderators: Praveen V. Mummaneni, Mark E. Shaffrey
Faculty: Domagoj Coric, Robert E. Isaacs, Michael P. Steinmetz, Nicholas Theodore, Michael Y. Wang
Learning Objectives: Upon completion of this seminar, participants will be able to:
Discuss the evidence basis for novel spinal robotic technology.

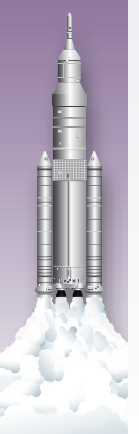
- › Evaluate how new spinal technology can be incorporated into your clinical practice.
- › Identify the relative strengths and weakness of new technology compared to more traditional approaches.

Brennan's of Houston

Brennan's of Houston has evolved into the city's premier destination for memorable dining served with true Southern hospitality. From the reservationist to the waiters, chefs and every associate behind the scenes, their team is focused on the highest standard of excellence. And the proof is in the (bread) pudding, with generations of loyal customers returning time and again to create new memories. Reflecting the same warmth as their friendly greeting, each farewell concludes with Brennan's signature lagniappe: an abundance of unforgettably fresh pecan pralines.

Zagat rates Brennan's of Houston as Houston's Best Restaurant.

Complimentary shuttle service will depart from the Marriott Marquis Houston at 7:15 pm.



7:00-8:30 am

Sunrise Science and Late Breaking Abstract Sessions



11:47-11:50 am

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

Graham T. Allison



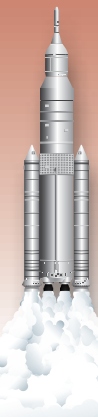
12:15-1:45 pm

Luncheon Seminars



2:45-4:15 pm

SECTION SESSIONS



CV 7:00–8:30 am**Cerebrovascular Guidelines: Aneurysms, Arteriovenous Malformations, and Acute Ischemic Stroke**

Moderators: Kevin M. Cockroft, Amir R. Dehdashti, JD. Mocco
Speakers: Sepideh Amin-Hanjani, E. Sander Connolly Kyle M. Fargen, Brian L. Hoh, Christopher P. Kellner, Adnan H. Siddiqui, Babu G. Welch

Course Description: A diverse and experienced panel of leaders in cerebrovascular neurosurgery will provide an overview of the most current guidelines in the neurosurgical treatment of brain aneurysms, brain arteriovenous malformations, and acute ischemic stroke.

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

- › Review the current guidelines for the treatment of brain aneurysms.
- › Identify the current guidelines for the treatment of brain AVMs.
- › Discuss the current guidelines for the neurosurgical treatment of acute ischemic stroke.

7:00–7:30 am

Guidelines for the Treatment of Cerebral Arteriovenous Malformations

7:00–7:15 am

Natural History and Management of Unruptured AVMs

Sepideh Amin-Hanjani

7:15 am–7:30 am

Management of Ruptured AVMs

Babu G. Welch

7:30–8:00 am

Guidelines for the Treatment of Cerebral Aneurysms

7:30–7:40 am

Screening, Natural History, and Medical Management

Brian L. Hoh

7:40–7:50 am

Indications and Outcomes of Surgery

E. Sander Connolly

7:50–8:00 am

Indications and Outcomes of Endovascular Surgery

Adnan H. Siddiqui

8:00–8:30 am

Guidelines for the Neurosurgical Treatment of Acute Ischemic Stroke

8:00–8:15 am

Update on Trials

Kyle M. Fargen

8:15–8:30 am

New Directions

Christopher P. Kellner

7:00–8:30 am

SUNRISE SCIENCE AND LATE BREAKING ABSTRACT SESSIONS

For a listing of Sunrise Science oral presentations, please see pages 70-73.

Learning Objectives:

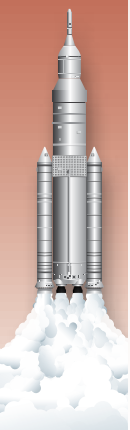
- › Analyze the findings of novel neurosurgical studies, critique the design and methodology.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Apply lessons of ongoing research to neurosurgical care of patients.

SP Sunrise Session and Late Breaking Abstract Session 3

Moderators: Nader S. Dahdaleh, Yi Lu, Alexander E. Ropper

SE TR Sunrise Session and Late Breaking Abstract Session 4

Moderators: Kathryn M. Beauchamp, Analiz Rodriguez



8:45 am–12:15 pm

GENERAL SCIENTIFIC SESSION III: Systems and Teams as a Means to Extend Human Performance

Presiding Officer: James S. Harrop

Moderators: Ashok R. Asthagiri, Elad I. Levy, Ali R. Rezai

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

- › Discuss the fundamental neurobiology underlying memory with therapeutic implications.
- › Review CEO perspectives on the changing macro-economic environment for health systems and strategic planning considerations for neurosurgical care delivery.
- › Identify expanding indications for skull base endoscopy and technical strategies for anterior skull base tumor resection.

8:45–8:46 am

Introduction and Disclosures

James S. Harrop

8:46–8:56 am

Neurosurgical Pain Care—Opioids and Opportunities

Joshua M. Rosenow

8:56–9:02 am

Neurosurgery Cerebrovascular Paper of the Year

9:02–9:14 am

Neuromodulation in Stroke

Andre Machado

9:14–9:26 am

Endoscopic Skull Base Surgery: Finding but not Pushing the Edge of the Envelope

Theodore H. Schwartz

9:45–10:45 am

Morning Beverage Break

Visit the Exhibit Hall

10:00–10:30 am

Live Surgery in the Exhibit Hall

Sponsored by



10:45–10:49 am

AANS President

Shelly D. Timmons

10:49–10:53 am

NEUROSURGERY® Publications Update

Nelson M. Oyesiku

10:53–10:58 am

Washington Committee Report

Ann R. Stroink

11:01–11:06 am

Founder's Laurel Award Presentation

A. Leland Albright
Presented by
Alan M. Scarrow



11:06–11:47 am

CEO Panel

Moderator: Ali R. Rezai

Panel: Marc Boom, Stephen K. Klasko, Ali R. Rezai, Nancy Schlichting, Albert Wright

11:47–11:50 am

Introduction of CNS Michael L. J. Apuzzo Lecturer on Creativity and Innovation

9:26–9:45 am

Honored Guest

The Evolution of Neurovascular Surgery: Procedural or Disease Oriented?

Robert H. Rosenwasser



10:58–11:01 am

Distinguished Service Award Presentation

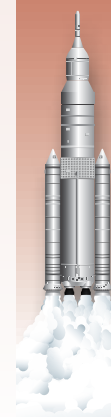
Mark N. Hadley
Presented by
Alan M. Scarrow



11:50 am–12:15 pm

CNS Michael L. J. Apuzzo Lecturer on Creativity and Innovation

Graham T. Allison



12:15–1:45 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).

SE

T12 Medical Malpractice Update 2018**Moderator:** Richard N. Wohns**Faculty:** Jeffrey W. Cozzens, Bharat Guthikonda, Alan M. Scarrow, Gary R. Simonds**Learning Objectives:** Upon completion of this seminar, participants will be able to:

- › Outline the salient and current demographics of medical alpractice environment.
- › Summarize the status and barriers to meaningful tort reform.
- › Contrast similarities and differences in employment models that alter perceptions and the processing of malpractice cases.

CV

T13 Dural AV Fistula: Diagnosis, Classification, and Management**Moderator:** Amir R. Dehdashti**Faculty:** Rose Du, Louis J. Kim, Leonardo Rangel-Castilla, Matthew Reynolds**Learning Objectives:** Upon completion of this seminar, participants will be able to:

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

CV

T14 Update on the Management of Anti-coagulation and Anti-platelet Therapies in Neurosurgical Patients**Moderator:** Chad W. Washington**Faculty:** Alan S. Hoffer, R. Loch Macdonald, Shahid M. Nimjee**Learning Objectives:** Upon completion of this seminar, participants will be able to:

- › List available antidotes for anti-coagulants.
- › Describe the mechanism of action of reversal agents.
- › List pros and cons of giving platelets.

SP

T15 Spinal Tumor Surgery: Case-based Management**Moderators:** Joseph S. Cheng, Ziya L. Gokaslan**Faculty:** Mark H. Bilsky, Charles Fisher, Aruna Ganju, Ilya Laufer, Laurence D. Rhines**Learning Objectives:** Upon completion of this seminar, participants will be able to:

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

SP

T16 Peak Performance: Optimizing the Spine Surgical Patient from Pre-op to Post-op**Moderators:** Scott A. Meyer, Marjorie C. Wang**Faculty:** Christopher M. Holland, John J. Knightly, Laura A. Snyder, Anand Veeravagu, Robert G. Whitmore**Learning Objectives:** Upon completion of this seminar, participants will be able to:

- › Discuss approaches for identifying high-risk spine surgical patients.
- › Describe strategies for medical optimization of spine surgical patients from prior through surgery and the perioperative period.
- › Discuss the impact of medical optimization on complication avoidance and improved patient outcomes.

TR

T17 Combat and Mass Casualties: Neurosurgery Under Fire**Moderator:** Rocco Armonda**Faculty:** James M. Ecklund, Andres M. Rubiano, Jeffrey M. Tomlin**Learning Objectives:** Upon completion of this seminar participants will be able to:

- › Identify unique challenges to neurosurgery in the setting of combat and mass-casualty situations.
- › Implement a triage plan for sports-related injuries.
- › Recognize the utility of triage for promoting best practices and outcomes in combat.

PA

T18 SCS: Evidence and Applications**Moderator:** Erika A. Petersen**Faculty:** Ellen L. Air, Francisco A. Ponce, Alexander S. Taghva**Learning Objectives:** Upon completion of this seminar, participants will be able to:

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

PE

T19 Pediatric Dystonia: Advancements with DBS and Management Updates**Moderator:** Kendall H. Lee**Faculty:** Aviva Abosch, Scellig S. D. Stone**Learning Objectives:** Upon completion of this seminar, participants will be able to:

- › Discuss the surgical and medical options for management of pediatric dystonia.
- › Review the available data on DBS management for dystonia.
- › Identify challenges and limitations for surgical dystonia management in children.

SUBSPECIALTY SESSION TRACK KEY

AP Advanced Practice Provider

PA Pain

RE Resident

SF Stereotactic and Functional

TR Neurotrauma

CV Cerebrovascular

PE Pediatric

SE Socioeconomic

SP Spine and Peripheral Nerves

TU Tumor

TU



SANS
Lifelong Learning

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

T20 Malignant Gliomas: Advances in Surgery and Adjuvant Therapy

Moderator: E. Antonio Chiocca

Faculty: Jeffrey N. Bruce, Bob S. Carter, Costas G. Hadjipanayis, Ian F. Parney

Learning Objectives: Upon completion of this seminar, 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.

TU

T21 Management of Pituitary Adenomas and Parasellar Pathology

Moderator: Gabriel Zada

Faculty: Ian F. Dunn, Antonio A. Dutra do Souto, Andrew S. Little, Susan Samson, Jason P. Sheehan

Learning Objectives: Upon completion of this seminar, 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.

WINS

T22 Diversity in Learning: New Initiatives in Mentorship

Moderator: Beverly C. Walters

Faculty: Lola B. Chambless, Mariangela B. Goncalves, Julie G. Pilitsis

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

- › Identify the importance of life-long coaching in and out of the OR and how to find mentors.
- › Determine how generational, gender, and cultural differences might affect the mentor-mentee relationship.
- › Identify how business models might be applied to neurosurgery in terms of mentorship.

1:00–2:00 pm

NEUROSURGERY® Publications Editor-in-Chief Roundtable

1:45–2:45 pm

Afternoon Beverage Break Visit the Exhibit Hall

1:45–2:45 pm

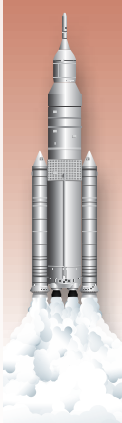
CNS Resident SANS Challenge Championship Round



2:00–2:45 pm

Annual Business Meeting

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



SECTION SESSIONS

SE 2:45–4:15 pm**COUNCIL OF STATE NEUROSURGICAL SOCIETIES****Moderators:** Joseph S. Cheng, Darlene A. Mayo**Speakers:** Nathan R. Selden**Learning Objectives:** Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.

2:45–3:15 pm

Mission to Educate and Teach—Socioeconomics and the Future of Neurosurgical Education

Nathan R. Selden

3:15–4:15 pm

Oral Abstract Presentations

See page 66 for Oral Papers 153-162

CV 2:45–4:15 pm**SECTION ON CEREBROVASCULAR SURGERY****Moderators:** Christoph J. Griessenauer, Sharon W. Webb**Speakers:** H. Hunt Batjer, J. D. Mocco**Learning Objectives:** Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Identify the breadth of neurosurgery research.
- › Apply the body of work of the Hopkins lecturer.
- › Identify the challenges of educating comprehensive cerebrovascular surgeons.

2:45–3:15 pm

Oral Abstract Presentations

See pages 65-66 for Oral Papers 148-152

3:15–3:20 pm

Introduction of Hopkins Lecture

J. D. Mocco

3:20–3:45 pm

Nick Hopkins Lecture

3:45–4:15 pm

Educating the Cerebrovascular Surgeon of the Future

H. Hunt Batjer

SP 2:45–4:15 pm**SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES****Moderators:** Laura A. Snyder, Khoi D. Than**Learning Objectives:** Upon completion of this session, participants will be able to:

- › Analyze the findings of novel spine studies and critique the design and methodology.
- › List important areas for further knowledge development and research.
- › Apply results from areas of recent clinical research to their management of patients with spinal disease.

2:45–4:15 pm

Oral Abstract Presentations

See pages 66-67 for Oral Papers 163-177

TR 2:45–4:15 pm**SECTION ON NEUROTRAUMA AND CRITICAL CARE****Moderators:** Craig H. Rabb, Gary T. Schwartzbauer**Learning Objectives:** Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.

2:45–4:15 pm

Oral Abstract Presentations

See pages 67-68 for Oral Papers 178-192

PA 2:45–4:15 pm**SECTION ON PAIN****Moderators:** Sean J. Nagel**Speakers:** Scott Lempka, Jason M. Schwalb**Learning Objectives:** Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Describe how neuroimaging could be used in the future to guide treatment.
- › Explain how spinal cord stimulation relieves pain from a neurophysiologic perspective.
- › Incorporate new outcome measures for pain into practice.

2:45–3:27 pm

The Science of Chronic Pain: Neuroimaging, Neurophysiology, and Measuring Response to Treatment with Neuromodulation

2:45–3:05 pm

Neurophysiology

Scott Lempka

3:05–3:25 pm

Outcomes

Jason M. Schwalb

3:25 pm–3:27 pm

Questions and Discussion

3:27–4:15 pm

Oral Abstract Presentations

See page 68 for Oral Papers 193-200

PE 2:45–4:15 pm**SECTION ON PEDIATRIC NEUROLOGICAL SURGERY****Moderators:** Carolyn Quinsey, Jeffrey S. Raskin**Speakers:** Sandi Lam, W. J. Oakes**Learning Objectives:** Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Discuss recent scientific advances in pediatric neurosurgery, as presented in the oral abstracts.
- › Review the specialty and institutional challenges with quality monitoring.
- › Identify tools for monitoring quality measures in a pediatric neurosurgery practice.

SUBSPECIALTY SESSION TRACK KEY

AP Advanced Practice Provider

PA Pain

RE Resident

SF Stereotactic and Functional

TR Neurotrauma

CV Cerebrovascular

PE Pediatric

SE Socioeconomic

SP Spine and Peripheral Nerves

TU Tumor

2:45-3:15 pm

Oral Abstract Presentations

See pages 68-69 for Oral Papers 201-205

3:15-3:35 pm

Monitoring Quality as a Specialty: Available Tools and Ideas for Improvement

Sandi Lam

3:35-3:55 pm

Controversies and Challenges in Quality Improvement

W. J. Oakes

3:55-4:15 pm

Discussion Panel

Moderator: Sandi Lam

Discussants: Liliana Goumnerova, Ganesalingam Narenthiran, W. J. Oakes

SF 2:45-4:15 pm

SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY

Moderators: Joseph S. Neimat, Sameer A. Sheth

Speakers: Aviva Abosch, Brian H. Kopell, Joseph S. Neimat, Sameer A. Sheth

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Explain current theories about functional networks that underlie human psychology and how pathology within these networks lead to psychiatric disorders.
- › Describe recent advances in the neuromodulatory management of psychiatric conditions.
- › Utilize the latest evidence in psychiatric neurosurgery to optimize patients with medically refractory psychiatric disease.

2:45-3:33 pm

Psychiatric Disorders as Network Disorders

2:45-2:55 pm

Neurophysiological Basis of Cognitive/Limbic Networks

Sameer A. Sheth

2:55-3:05 pm

Advances in Neuroimaging of Network Structure

Aviva Abosch

3:05-3:15 pm

Network Modulation in OCD

Brian H. Kopell

3:15-3:25 pm

Network Modulation in Depression

Joseph S. Neimat

3:25-3:33 pm

Questions and Discussion

3:33-4:15 pm

Oral Abstract Presentations

See page 69 for Oral Papers 206-212

TU 2:45-4:15 pm

SECTION ON TUMORS

Moderators: Manish K. Aghi, Seunggu J. Han

Speakers: Orin Bloch, Constantinos G. Hadjipanayis, Karl Schaller

Learning Objectives: Upon completion of this session, attendees will be able to:

- › Analyze the findings of novel neurosurgical studies; critique the design and methodology of these studies.
- › List important areas for further knowledge development and research.
- › Identify the most important ongoing clinical trials.
- › Describe the novel technological adjuncts to brain tumor surgery.
- › Discuss the regulatory challenges of applying new technologies for clinical use.
- › Discuss the successful models of partnerships with bio-engineering industry.

2:45-3:30 pm

Technological Advances in Adjuncts to Brain Tumor Surgery

2:45-3:00 pm

Fluorescence

Constantinos G. Hadjipanayis

3:00-3:15 pm

Augmented Reality

3:15-3:30 pm

Adaptive Hybrid Surgery

Orin Bloch

3:30-4:12 pm

Oral Abstract Presentations

See pages 69-70 for Oral Papers 213-219

4:12-4:15 pm

Questions and Discussion



CASE-BASED DISCUSSION SESSIONS

Faculty will present cases to be examined, discussed, and debated by both the audience and the panel. Registered attendees are encouraged to submit cases for consideration prior to July 31. [Visit cns.org/2018](http://cns.org/2018) for details.

SP 4:15–6:15 pm**CASE-BASED DISCUSSION SESSION: Cervical and Thoracolumbar Trauma****Moderators:** Mohamad Bydon, Daniel C. Lu**Discussants:** Victor W. Chang, Bradley Jacobs, Michele M.

Johnson, Eric A. Potts, Wilson Z. Ray, Laura A. Snyder, Cheerag D. Upadhyaya, Todd D. Vogel

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

- › Discuss various treatment options for the management of cervical and thoracolumbar trauma.
- › Describe common complications in cervical and thoracolumbar trauma.
- › Discuss strategies for identifying and avoiding complications in cervical and thoracolumbar trauma.

PE 4:15–6:15 pm**CASE-BASED DISCUSSION SESSION: Management of Pediatric Spine Trauma****Moderator:** Elias B. Rizk**Discussants:** Douglas L. Brockmeyer, Andrew H. Jea, Brian J. Kelley, Jamal McClendon, Christina M. Sayama**Learning Objectives:** Upon completion of this session, participants will be able to:

- › Review management strategies for pediatric spine injuries.
- › Discuss treatment options for challenging cases of pediatric spine trauma.
- › Describe advances in the management of pediatric spine trauma.

SF 4:15–6:15 pm**CASE-BASED DISCUSSION SESSION: STN Versus GPI: Key Clinical Trials****Moderators:** Jonathan Miller, Erika A. Petersen**Discussants:** Ron L. Alterman, Darlene A. Mayo**Learning Objectives:** Upon completion of this session, participants will be able to:

- › Describe the anatomic location and neurophysiological connections of each target that accounts for therapeutic benefit in Parkinson's Disease.
- › Outline the advantages and limitations of stimulation of each target and how these impact selection for specific disease patterns.
- › Compare findings from key clinical trials, directly comparing STN to GPI DBS.

TU 4:15–6:15 pm**CASE-BASED DISCUSSION SESSION: Brain Metastases—Case Review****Moderator:** Daniel P. Cahill**Discussants:** Lawrence S. Chin, John S. Kuo, Jeffrey J. Olson, Jonathan H. Sherman**Learning Objectives:** Upon completion of this session, participants will be able to:

- › Describe the different methods for treating brain metastases: surgery, radiation, LITT, chemotherapy/immunotherapy.
- › Discuss recent literature on the management of multiple brain metastases.
- › Discuss role of immunotherapy in treating brain metastases.

TR 4:15–6:15 pm**CASE-BASED DISCUSSION SESSION: Ethical Controversies in Neurotrauma****Moderator:** Patricia B. Raksin**Discussants:** Perry Ball, Philip A. Villanueva**Learning Objectives:** Upon completion of this session, participants will be able to:

- › Develop strategies for dealing with complex ethical issues in neurosurgery.
- › Articulate the process of an ethics evaluation.
- › Identify stewardship with respect to medical resources.

CV 4:15–6:15 pm**CASE-BASED DISCUSSION SESSION: Multi-modality Treatment of Cerebral AVMs****Moderator:** Chad W. Washington**Discussants:** Feres E.A. Chaddad Neto, Evandro De Oliveira, Louis J. Kim, Demetrius K. Lopes, Gustavo G. Luzardo, Peter Nakaji, Eric C. Peterson, Eric Sauvageau**Learning Objectives:** Upon completion of this session, participants will be able to:

- › Determine the role of microsurgery in AVM treatment.
- › Determine the role of embolization in AVM treatment.
- › Determine the role of radiosurgery in AVM treatment.

6:15–7:15 pm

Resident Recruitment Social

Completing residency soon? Seize the opportunity to meet potential future colleagues, recruiters, and new friends.



SF 7:30-9:30 pm \$190 (includes three-course dinner and beverage)

DINNER SEMINAR 4

DIN4: Emerging Indications for Functional Neurosurgery: Tourette, OCD, Depression, and Pain

Moderators: Alon Y. Mogilner, Sameer A. Sheth

Faculty: Alessandra A. Gorgulho, Casey H. Halpern

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

- > Describe and employ reported outcomes in DBS for Tourette's disease.
- > Critically appraise the evidence for DBS for OCD.
- > Assess and apply the evidence for DBS for depression and chronic pain to management of patients with medically refractory disease.

The Grove

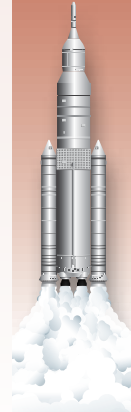
The Grove offers a modern and elegant urban dining experience unlike anything else in downtown Houston. Situated in a one-of-a-kind setting on the south end of Houston's 11.8-acre urban park Discovery Green, the legendary Schiller Del Grande Restaurant Group's latest offering is the definitive see-and-be-seen culinary hotspot in Houston's urban core.

Zagat rates The Grove as Houston's Best Outdoor Dining experience.

The Grove is just a short walk from the Marriott Marquis Houston.



DINNER SEMINAR



Nexus

Nexus is a comprehensive, case-based repository of neurosurgical operative techniques and approaches enhanced with intraoperative images, medical illustrations, and operative video.



There is simply nothing like it.

Whether you're going into the OR, or want to quickly review an approach, Nexus gives you exactly what you need, when you need it, with the most up-to-date clinical techniques.

cns.org/nexus

Thank You Nexus Editorial Board

Nicholas C. Bambakidis
Co-chair

Peter Nakaji
Co-chair / Vascular Editor

Maryam Rahman
Managing Editor

Louis J. Kim
Endovascular Editor

Steven N. Roper
Epilepsy Editor

Francisco A. Ponce
Functional Editor

Ahmed M. Raslan
Pain Editor

Krystal L. Tomei
Pediatric Editor

Mark A. Mahan
Peripheral Nerve Editor

Garni Barkhoudarian
Pituitary/Endonasal Editor

Daniel J. Hoh
Spine Editor

Martina Stippler
Trauma Editor

Constantinos G. Hadjipanayis
Tumor Editor

Michael J. Link
Approaches Editor

Kim Duval
Editor

Simone Dekker
Editor

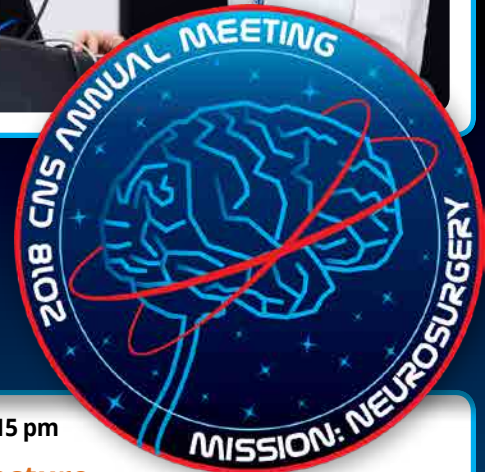
7:00-8:30 am

Guidelines on Skull Base Update



7:00-8:30 am

**Sunrise Session and
Late Breaking Abstracts**



9:10-9:30 am

Special Lecture

**Can We Create New Senses for
Humans?**

David Eagleman



11:47 am-12:15 pm

Special Lecture

The New Era of Extreme Bionics

Hugh Herr



TU 7:00–8:30 am

Guidelines on Skull Base Update

Moderator: Chirag G. Patil

Speakers: Franco DeMonte, Paul A. Gardner, Jeffrey J. Olson, Chirag G. Patil, Gelareh Zadeh

Course Description: The session will provide an overview of the current evidence guiding the management of skull base tumors.

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

- › Discuss the current guidelines and evidence for management of vestibular schwannomas.
- › Discuss the current guidelines and evidence for management of chordomas.
- › Discuss the evidence behind the current guidelines for management of malignant skull base tumors.

7:00–7:05 am

Introduction

Chirag G. Patil

7:05–7:25 am

Vestibular Schwannoma Guidelines

Jeffrey J. Olson

7:25–7:45 am

Chordoma Guidelines

Paul A. Gardner

7:45–8:05 am

Meningioma

Gelareh Zadeh

8:05–8:25 am

Skull Base Malignancies

Franco DeMonte

8:25–8:30 am

Questions and Discussion

7:00–8:30 am

SUNRISE SCIENCE AND LATE BREAKING ABSTRACT SESSIONS

For a listing of Sunrise Science oral presentations, please see pages 70-73.

Learning Objectives:

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

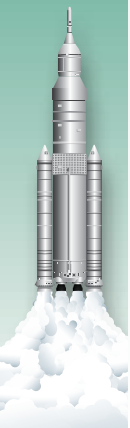
SF PA Sunrise Session and Late Breaking Abstract Session 5

Moderators: Brian Dalm, Charles B. Mikell

PE Sunrise Session and Late Breaking Abstract Session 6

Moderators: Mari L. Groves, Brandon G. Rocque

NASA Space Center



8:45 am–12:15 pm

GENERAL SCIENTIFIC SESSION IV: Neurosurgery Future State

Presiding Officer: Steven N. Kalkanis

Moderators: Lola B. Chambless, Praveen V. Mummaneni

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

- › Review enhancements in sensory materials science to augment aural experience in deaf patients.
- › Discuss advancements in bionics materials science to improve prosthetics.
- › Identify Parkinson's Disease patients who may benefit from neurosurgical procedures.

8:45–8:48 am

Introduction and Disclosures

8:48–8:54 am

Neurosurgery Stereotactic and Functional Paper of the Year

8:54–9:00 am

Neurosurgery Socioeconomics, Health Policy, and Law Paper of the Year

9:00–9:10 am

Redefining the Mission for DBS and Parkinson's Disease

Peter Konrad



9:10–9:30 am

Special Lecture

Can We Create New Senses for Humans?
David Eagleman

9:30 am–9:36 am

Neurosurgery Pediatrics Paper of the Year

9:36–9:45 am

Brazilian Neurosurgical Society Presidential Address

Ronald de Lucena Farias

9:45–10:45 am

Morning Beverage Break

Visit the Exhibit Hall

10:00–10:30 am

Live Surgery in the Exhibit Hall

Sponsored by **Canon**
CANON MEDICAL SYSTEMS USA, INC.

10:45–10:48 am

Announcement of SANS Challenge Winners, Top Posters, and Residency Program Abstract Competition Winners

Ashok R. Asthagiri

10:48–10:51 am

Announcement of Innovator of the Year

Lola B. Chambless

10:51–10:54 am

Preview of 2019 CNS Annual Meeting in San Francisco

Ganesh Rao

10:54–11:04 am

Inappropriate Surgical Indications and the ABNS

Carl B. Heilman

11:04–11:14 am

Patient Selection in Spinal Surgery: Striking a Balance

Daniel K. Resnick

11:14–11:24 am

The Future of Cerebrovascular Surgery: Near and Far

E. Sander Connolly

11:24–11:34 am

Challenges in Neurosurgical Oncology

Ganesh Rao

11:34–11:44 am

Japanese CNS Presidential Address

Jun Takahashi

11:44–11:47 am

Introduction of Hugh Herr

Sameer A. Sheth



11:47 am–12:15 pm

Special Lecture

The New Era of Extreme Bionics
Hugh Herr



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

W23 Spinal Arteriovenous Fistulae and Malformations: Management Strategies in 2018

Moderator: Stacey Q. Wolfe

Faculty: Mohammad A. Aziz-Sultan, Andrew F. Ducruet, Roberto C. Heros, Peter Nakaji, Robert F. Spetzler

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

- › Describe the history and classification of spinal arteriovenous malformations.
- › Identify best treatment modalities (surgical, endovascular, and radiosurgical) for the management of specific arteriovenous malformations.
- › Apply surgical techniques and nuances to management of spinal dural fistulae and arteriovenous malformations.

CV

W24 Contemporary and Practical Management of an Enigmatic Process: Cerebral Vasospasm (Delayed Cerebral Ischemia)

Moderator: Ketan R. Bulsara

Faculty: Peng R. Chen, David M. Hasan, R. Loch Macdonald, Laligam N. Sekhar

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

- › Review the role of nimodipine.
- › Discuss the role of angioplasty
- › Learn about emerging therapies.

SP

W25 Novel Techniques for Management of Lumbar Spondylolisthesis

Moderator: Gregory R. Trost

Faculty: Charles L. Branch, Nathaniel P. Brooks, John H. Chi, Christoph P. Hofstetter, John H. Shin, Robert G. Whitmore

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

- › Discuss diagnosis, classification, and indications for treatment of lumbar spondylolisthesis.
- › Describe various surgical techniques and approaches for neural decompression, spinal stabilization, and spondylolisthesis correction.
- › Identify and avoid complications in the management of lumbar spondylolisthesis.

SP



CNS

SANS
Lifelong Learning

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

W26 Peripheral Nerve Entrapment Syndromes: Diagnosis and Management

Moderator: Line G. Jacques

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

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

- › Describe a systematic approach to evaluation of patients with peripheral nerve entrapment syndromes.
- › Develop a non-operative or operative management strategy for these conditions.
- › Discuss advantages and disadvantages and expected outcomes of various surgical approaches.

TR

W27 Sports-related Injuries

Moderator: Martina Stippler

Faculty: Paul M. Arnold, Paul McCrory, Efstathios Papavassiliou, Christopher J. Winfree

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

- › Evaluate neurological injuries that occur in sports.
- › Articulate how concussions are diagnosed.
- › Categorize the natural history of sports-related injuries and what treatments are available for them.

PE

TR

W28 Pediatric Head Trauma

Moderator: Brian J. Kelley

Faculty: Robert J. Bollo, Christina M. Sayama, Eric A. Sribnick

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

- › Discuss the unique challenges associated with head injury in the pediatric population.
- › Review current practice standards for management of pediatric head injury.
- › Identify current updates and advances in the care of pediatric patients with traumatic head injury.

TU

W29 Cutting-edge Management of Brain Metastasis

Moderator: Daniel P. Cahill

Faculty: Ekkehard M. Kasper, Sujit S. Prabhu, Patrick Wen

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

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

TU

W30 Advanced Imaging of Brain Tumors

Moderator: Shawn L. Hervey-Jumper

Faculty: Benjamin M. Ellingson, Edward A. Neuwelt

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

- › Outline the different modalities currently available and under investigation for visualizing brain tumors.
- › Explain the roles of the various imaging modalities used for brain tumors.
- › Describe the evidence for the biological processes being visualized by advanced imaging.

WINS

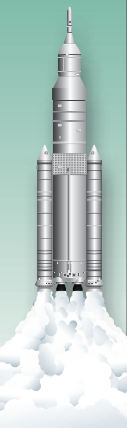
W31 Enhancing Communication Skills to Lead Your Practice

Moderator: Ellen L. Air

Faculty: Sharona Ben-Haim, Eugenie S. Kleinerman

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

- › Review Press-Ganey scores (whether or not you agree): How to improve your patients' experiences and your bottom line by improving your communication skills.
- › Utilize your leadership skills to coach conflict management within your team.
- › Execute negotiation skills for both personal and departmental advancement.



OCTOBER

8

MONDAY

Section on Cerebrovascular Surgery Oral Presentations

2:45–2:51 pm

101 Risk Factors and Outcomes of Postoperative Complications in Adult Patients with Moyamoya Disease
Meng Zhao, Jizong Zhao

2:51–2:57 pm

GALBRAITH AWARD
102 Genome Wide Analysis in Inbred Mice Identifies Distinct Single Nucleotide Polymorphisms Associated with Cerebral Vasospasm and Neurological Outcome Following Subarachnoid Hemorrhage

Robert F. Rudy, Baogang Qian, Michael J. Strong, John Zhang, Arthur L. Day, Scott T. Weiss, Rose Du

2:57–3:03 pm

103 Brain Functional Reconfiguration and Cognitive Impairment in Adult Moyamoya Disease: A Resting-state fMRI Study
Yu Lei

3:03–3:09 pm

104 The Natural Course of Moyamoya Disease in Patients with Prior Hemorrhagic Stroke: Clinical Outcome and Risk Factors for Recurrent Stroke

Jizong Zhao, Xingju Liu, Dong Zhang

3:09–3:15 pm

105 Decreases in Blood Pressure During Endovascular Stroke Therapy are Common and Associated with Poor Functional Outcome

David Mampre, Anson Wang, Kevin Sheth, Can Ozan Tan, Ryan M. Hebert, Charles Christian Matouk, Nils Petersen

3:15–3:21 pm

106 Sacrificing the Superior Petrosal Vein During Microvascular Decompression Does Not Increase Vascular Complications: Experience from One Institution

Yuanxuan Xia, Timothy Y. Kim, Leila A. Mashouf, Kisha K. Patel, Risheng Xu, Joshua Casaos, Eileen Kim, Alice L. Hung, Adela Wu, Tomas Garzon-Muvdi, Matthew T. Bender, Christopher M. Jackson, Chetan Bettegowda, Michael Lim

3:21–3:27 pm

107 Prospective Randomized Study Comparing Clinical, Functional, Aesthetic, and Quality of Life Results of Transpalpebral, Nanopterional, and Classic Pterional Approaches

Mauricio Mandel, Rafael Tutihashi, Eberval G. Figueiredo, Jefferson Rossi Junior, Brasil Jeng, Manoel Jacobsen Teixeira

3:27–3:33 pm

108 Intraoperative Technical Complications in Cerebral Revascularization Surgery: An Analysis of 430 Consecutive Cases

James S. Yoon, Joseph R. Linzey, Jan-Karl Burkhardt, Jacob F. Baranoski, Justin R. Mascitelli, Michael T. Lawton

3:33–3:39 pm

109 Development of an Endovascular Transvenous Delivery System for Implantation of an Inferior Petrosal Sinus Transdural Cerebrospinal Fluid Shunt.

Adel M. Malek, Carl B. Heilman

3:39–3:45 pm

110 Patient-Specific Cerebral Regional Blood Flow Model Using Quantitative MR Angiography to Predict Stump Pressure

Daniel Li, Meide Zhao, Sepideh Amin-Hanjani, Robert Kufahl, Xinjian Du, Victor A. Aletich, Ali Alaraj, Jianmin Li, Fady T. Charbel

Council of State Neurosurgical Societies Oral Presentations

3:15–3:21 pm

111 Returns to Operating Room After Neurosurgical Procedures in a Tertiary Care Academic Medical Center: Implications for Health Care Policy and Quality Improvement

Panagiotis Kerezoudis, Amy E. Glasgow, Mohammed A. Alvi, Robert J. Spinner, Anshit Goyal, Fredric B. Meyer, Mohamad Bydon, Elizabeth B. Habermann

3:21–3:27 pm

JULIUS GOODMAN RESIDENT AWARD

112 Patient Out-of-pocket Spending for Neurosurgical Operations is Increasing: Analysis of 13,673 Consecutive Cases from a Tertiary Referral Center

Michael A. Mooney, Seungwon Yoon, Tyler S. Cole, John P. Sheehy, Michael Bohl, Frank Barranco, Peter Nakaji, Andrew S. Little, Michael T. Lawton

3:27–3:33 pm

113 Cost-utility of Revisions for Cervical Deformity Correction Warrants Minimization of Reoperations

Samantha R. Horn, Peter G. Passias, Renaud Lafage, Virginie Lafage, Justin S. Smith, Breton G. Line, Gregory M. Mundis Jr., Michael P. Kelly, Themistocles Protopsaltis, Han Jo Kim, Cole Bortz, Frank Segreto, Muhammad Janjua, Alan H. Daniels, Eric Klineberg, Douglas C. Burton, Robert Hart, Frank Schwab, Shay Bess, Christopher I. Shaffrey, Richard A. Hostin Jr., Christopher P. Ames, International Spine Study Group

3:33–3:39 pm

114 The Effect of Best Practice Alerts in Electronic Medical Records for Low Back Pain Imaging

Yi-Ren Chen, Doris Chen

3:39–3:45 pm

115 Neurosurgical Resident Attrition

Michael D. White, Nitin Agarwal, Susan C. Pannullo, Lola B. Chambless

Section on Pain Oral Presentations

3:33–3:39 pm

RONALD R. TASKER YOUNG INVESTIGATOR AWARD

116 Exome Sequencing Uncovers Molecular Determinants of Trigeminal Neuralgia

Jungmin Choi, Xue Zeng, Sheng Chih Jin, Jonathan Gaillard, Daniel Duran, Carol Nelson-Williams, Shreyas Panchagnula, Sulayman Dib-Hajj, Frederick G. Barker III, Raymond F. Sekula Jr., Stephen Waxman, Murat Gunel, Richard P. Lifton, Kristopher T. Kahle

3:39–3:45 pm

117 Targeted Muscle Reinnervation Successfully Treats Neuroma Pain and Phantoms in Major Limb Amputees: A Randomized Clinical Trial

Lauren M. Mioton, Gregory A. Dumanian, Jennie Cheesborough, Ian Valerio

3:45–3:51 pm

118 Use of MR Texture Analysis to Predict Outcome After Percutaneous Cordotomy for Medically Refractory Cancer Pain

Aditya Vedantam, Islam Hassan, Aikaterini Kotrotsou, Rivka R. Colen, Ashwin Viswanathan

3:51–3:57 pm

119 Case Series: Outcomes in Peripheral Nerve Stimulation for Medically Refractory Atypical Facial Pain

James T. McMahon, Muhibullah S. Tora, J. Nicole Bentley, Melissa A. Campbell, Orion P. Keifer, Nicholas M. Boulis

3:57–4:03 pm

120 Preoperative Predictors of Poor Postoperative Pain Control: Systematic Review and Meta-Analysis

Michael M.H. Yang, Rebecca Hartley, Alexander Leung, Paul Ronksley, Nathalie Jette, Steven Casha, Jay Riva-Cambrin

4:03–4:09 pm

121 Opioid Disposal Patterns in Postoperative Adult Spine Patients: Are We Over Prescribing

Jihad Abdelgadir, Jacquelyn Corely, Aaron Tarnasky, Kevin Wall, Hanna Kemeny, Diego Galan, Edmund Ong, C. Rory Goodwin, Padma Gulur, Isaac O. Karikari

Section on Pediatric Neurological Surgery Oral Presentations

2:45–2:51 pm

123 Hydrocephalus Due to Intraventricular Hemorrhage is Determined by P-glycoprotein Expression in an Experimental Model

Satish Krishnamurthy, Jie Li, Yimin Shen, E. Mark Haacke

2:51–2:57 pm

124 Intraventricular Hemorrhage Clearance Markers in Human Neonatal CSF: Predictors of Hydrocephalus and Outcome

Chandana Buddhala, Mounica Paturu, Diego Morales, Christopher Smyser, David D. Limbrick Jr., Kelly B. Mahaney, Jennifer Strahle

2:57–3:03 pm

125 De Novo Mutations in Genes Regulating Neural Stem Cell Fate in Human Congenital Hydrocephalus

Charuta G. Furey, Sheng Chih Jin, Andrew T. Timberlake, Jungmin Choi, Xue Zeng, Carol Nelson-Williams, Mohammad Mansuri, Qiongshi Lu, Daniel Duran, Shreyas Panchagnula, August Alloco, Jason K. Karimy, Jonathan Gaillard, Arjun Khanna, William Butler, Edward R. Smith, Benjamin C. Warf, David D. Limbrick Jr., Phillip B. Storm, Gregory G. Heuer, Bermans Iskandar, James M. Johnston Jr., Seth Alper, Bulent Guclu, Yasar Bayri, Yener Sahin, Charles C. Duncan, Michael L. DiLuna, Murat Gunel, Richard P. Lifton, Kristopher T. Kahle

3:03–3:09 pm

126 Postictal EEG Activity in Pediatric and Adult Patients Undergoing Epilepsy Surgery: A Network Perspective

Samuel Tomlinson, Ankit Khambhati, Rebecca M. Kamens, Brenda E. Porter, Eric D. Marsh

3:09–3:15 pm

127 Thermal Dynamics, Volumetrics, and Seizure Outcomes Following Magnetic Resonance-guided Laser Interstitial Thermal Therapy (MRgLITT) in Pediatric Lesional Epilepsy

Kelsey D. Cobourn, Islam Fayed, Shannon Sullivan, Chima Oluigbo

3:15–3:21 pm

128 Endoscopic Hemispherotomy Technique in Pediatric Epilepsy Surgery: Preliminary Experience in Clinical Implementation

Sandi Lam, Kathryn Wagner

3:21–3:27 pm

129 ICP Measurement Under General Anesthesia is Not Reliable

Ruth E. Bristol, Christina E. Sarris, Davinder Singh, Nicole Hooft

3:27–3:33 pm

130 Safety and Target Identification of Stereotactic Biopsy in Children with DIPG—The INFORM Study Experience

Ahmed El Damaty, Elke Pfaff, Karl L. Kiening, Andreas W. Unterberg, Olaf Witt, Heidi Baechli

3:33–3:39 pm

131 Dynamic Magnetic Resonance Imaging Parameters For Objective Assessment of the Magnitude of Tethered Cord Syndrome in Patients with Spinal Dysraphism

Suyash Singh, Sanjay Behari, Kamlesh S. Bhaisorra, Rajendra V. Phadke

3:39–3:45 pm

132 Ascent of the Conus Medullaris: A Retrospective Analysis of the Rate and Degree of Conus Ascent in Neonates

Andrew Fanous, Katie L. Konesky, John Paul G. Kolcun, Justice O. Agyei, Evan Winograd, Renée M. Reynolds

Section on Stereotactic and Functional Neurosurgery Oral Presentations

3:27–3:33 pm

STEREOTACTIC AND FUNCTIONAL NEUROSURGERY RESIDENT AWARD

133 Optogenetic Modulation of Inhibitory Cortical Interneuron Subtypes Regulates Epileptiform Activity in a Mouse Model of Seizures

Francesco Pucci, Barry Connors

3:33–3:39 pm

134 Recurrent Neural Networks Improve Classification of Episodic Memory Encoding

Akshay Arora, Sarah Segar, Gray Umbach, Bradley Lega

3:39–3:45 pm

135 Individualized High Density Electroencephalographic Source Imaging Technique in Presurgical Workup: Contribution to Surgical Strategy Making for Intractable Epilepsy Involving Mesial Temporal Lobe Structures

Rui Feng, Jie Hu, Jinsong Wu, Chengxin Ma, Liqin Lang, Bing Sun, Li Pan

3:45–3:51 pm

136 Posterior Parietal Cortex Encodes Peripersonal Space Within the Framework of Object Identity and Action Perception

Srinivas Chivukula, Tyson Aflalo, Nader Pouratian

3:51–3:57 pm

137 Dorsal Prefrontal Neurons Encode Theory-of-Mind

Benjamin L. Grannan, Mohsen Jamali, Ziv Williams

3:57–4:03 pm

138 Stereotactic Radiosurgery for Brainstem Arteriovenous Malformations: A Multicenter Study

Or Cohen-Inbar, Robert M. Starke, Cheng-Chia Lee, Hideyuki Kano, Paul P. Huang, Douglas Kondziolka, Inga S. Grills, Danilo Silva, Mahmoud A. Abbassy, Symeon Missios, Gene H. Barnett, L. Dade Lunsford, Jason P. Sheehan

4:03–4:09 pm

139 Epileptic Seizures and Ability to Work in Cavernous Angioma Located Within Eloquent Brain Areas

Marc Zanello, Megan Still, John Gooden, Henry Colle, Michel Wager, Philip C. De Witt Hamer, Anja Smits, Lorenzo Bello, Mathew Tate, Giannantonio Spena, Laurent Capelle, Santiago Gil Robles, Sylvio Sarubbo, Bertil Rydenhag, Juan Martino, Bernhard Meyer, Denys Fontaine, Nicolas Reyns, Christian Schichor, Philippe Metellus, Sandro M. Krieg, Emmanuel Mandonnet, Hugues Duffau, Johan Pallud

4:09–4:15 pm

140 Leukocyte RNA Expression Correlates with Seizure-Free Outcome Following Stereotactic Laser Amygdalohippocampotomy

Robert W. Bina, Willard S. Kasoff, Ryan Sprissler, Marlys H. Witte, Michael Bernas, Christina M. Walter, David M. Labiner, Michael Hammer, Martin E. Weinand

Section on Tumors Oral Presentations

3:36–3:42 pm

INTEGRA FOUNDATION TUMOR AWARD

141 Meningioma with Multiple Drivers: Genomic Landscape and Clinical Correlations

Evgeniya Tyrtova, Chang Li, Mark Youngblood, Daniel Duran, Julio D. Montejó Jr., Süleyman Coskun, Danielle F. Miyagishima, Kaya Bilguvar, International Meningioma Study Group, Murat Gunel

3:42–3:48 pm

AANS/CNS JS SKULL BASE SURGERY AWARD

142 Comparison of Volumetric Extent of Tumor Resection From a Prospective Multicenter Controlled Study of Fully Endoscopic Versus Microscopic Transsphenoidal Surgery for Nonfunctioning Pituitary Adenomas: The TRANSSPHER Study

Andrew S. Little, Daniel F. Kelly, William L. White, Paul A. Gardner, Juan C. Fernandez-Miranda, Michael R. Chicoine, Garni Barkhoudarian, James P. Chandler, Daniel M. Prevedello, Brandon D. Liebelt, John Sfondouris, Marc R. Mayberg

3:48–3:54 pm

BRAINLAB NEUROSURGERY AWARD

143 Stereotactic Radiosurgery for Skull Base Meningiomas: 20-year Long-term Outcomes with Volumetric Analysis

Mohana Rao Patibandla, Cheng-Chia Lee, Gokul C. Addagada, Jason P. Sheehan

3:54–4:00 pm

ROSENBLUM-MAHALEY CLINICAL BRAIN TUMOR RESEARCH AWARD

144 In Vivo Synergistic Effect of Checkpoint Blockade and Radiation Therapy Against Chordomas in a Humanized Mouse Model

Wataru Ishida, Hui Wang, Kyle McCormick, Aayushi Mahajan, Eric Feldstein, Michael Lim, Peter D. Canoll, Jeffrey N. Bruce, Yong-Guang Yang, Sheng-fu Lo

4:00–4:06 pm

145 Preoperative and Histological Features Predict Recurrence and Survival in Atypical Meningioma After Primary Total Resection

Joshua Loewenstern, Remi A. Kessler, Karan Kohli, Melissa Umphlett, Margaret Pain, Joshua B. Bederson, Mary Fowkes, Raj K. Shrivastava

4:06–4:12 pm

146 Development of a Miniaturized Robotic Platform for Stereotactic Neurosurgery: Experience with Stealth AutoGuide from the First Series of 133 Patients

Stefan Wolfsberger, Georgi Y. Minchev, Gernot Kronreif, Georg Widhalm, Svenja Maschke, Alexander Micko, Engelbert Knosp

4:12–4:18 pm

147 Pathological Correlation of Cellular Imaging Using Apparent Diffusion Coefficient (ADC) Quantification in Patients with Brain Metastases Following Gamma Knife Radiosurgery

Hamid Borghei-Razavi, Mayur Sharma, Todd Emch, Richard Prayson, Nancy Obuchowski, Daria Krivosheya, Bryan S. Lee, Alireza M. Mohammadi, Michael A. Vogelbaum, Gene H. Barnett, Samuel T. Chao, John H. Suh, Lilyana Angelov

OCTOBER

9

TUESDAY

Section on Cerebrovascular Surgery Oral Presentations

2:45–2:51 pm

148 Management of Unruptured Intracranial Aneurysms in the Elderly: A Cost-Effectiveness Analysis

Xiao Wu, Branden J. Cord, Samuel Aramis Cornelio Sommaruga, Charles C. Matouk, Ajay Malhotra

2:51–2:57 pm

149 An Intelligent Investigation into Prediction of Post Rupture Neurological Status After Aneurysmal Subarachnoid Hemorrhage

Nina Soutanian, Alireza Zali, Michael Brainin

2:57–3:03 pm

150 Off-Hour Presentation and Outcomes in Patients with Large Vessel Occlusion after Endovascular Therapy: A Matched Case-Control Study

Mehdi Bouslama, Jonathan A. Grossberg, Diogo C. Haussen, Michael R. Frankel, Raul G. Nogueira

3:03–3:09 pm

151 Groin-Hematoma in Patients Undergoing Manual Compression Following Sheath Pull

Arun Chandra, Bowen Jiang, Matthew Bender, Jessica K. Campos, David A. Zarrin, Chau D. Vo, Robert W.C. Young, Justin Caplan, Judy Huang, Rafael J. Tamargo, Li-Mei Lin, Geoffrey P. Colby, Alexander L. Coon

3:09–3:15 pm

152 Intracranial Dural Arteriovenous Fistulas with Cortical Venous Drainage: Gamma Knife Radiosurgery as the Treatment of Choice

Deepak Agrawal, Hardik Sardana, Manmohan Singh, S.S. Kale

Council of State Neurosurgical Societies Oral Presentations

3:15–3:21 pm

153 Malpractice Litigation in Brain Tumor Surgery: A 31-Year Analysis of Causative Factors in the United States

Remi A. Kessler, Joshua Loewenstern, Sabrina Chen, Ansh Bhammar, Karan Kohli, Constantinos G. Hadjipanayis, Deborah L. Benzil, Joshua B. Bederson, Raj K. Shrivastava

3:21–3:27 pm

SAMUEL HASENBUSCH YOUNG NEUROSURGEON AWARD

154 Overtriage in Patients with Complicated Mild Traumatic Brain Injury: A Socio-Economic Analysis of 1447 Hospitalizations

Bradley Dengler, Robert C. Chick, Sonia Plaza-Wuthrich, Mark Muir, Viktor Bartanusz

3:27–3:33 pm

155 Unplanned Returns to the Operating Room Within 30 Days in Neurosurgery: Insights from a National Surgical Registry

Panagiotis Kerezoudis, Mohammed A. Alvi, Robert J. Spinner, Fredric B. Meyer, Anshit Goyal, Yagiz Ugur Yolcu, Elizabeth B. Habermann, Mohamad Bydon

3:33–3:39 pm

156 Independent Associations with 30- and 90-Day Unplanned Readmissions After Elective Lumbar Spine Surgery: A National Trend Analysis of 144,123 Patients

Aladine A. Elsamadicy, Xinru Ren, Hanna Kemeny, Lefko Charalambous, Shervin Rahimpour, Theresa Williamson, C. Rory Goodwin, Muhammad M. Abd-El-Barr, Oren N. Gottfried, Jichun Xie, Nandan Lad

3:39–3:45 pm

157 Regional Trends and Variations in Spine Surgery Utilization and Costs

James S. Yoon, Chaewon Yoon, Tiffany Blaine, Udaya K. Kakarla, Michael T. Lawton

3:45–3:51 pm

158 A Nationwide Analysis of Cost Variation for Cerebral Aneurysm Treatment

James S. Yoon, Chaewon Yoon, Ethan A. Winkler, Caterina Liu, Ildiko Torok, Michael T. Lawton

3:51–3:57 pm

159 ASA Status is Associated with Cost and Length of Stay in Lumbar Laminectomy and Fusion: Results from an Institutional Database

Rachel S. Bronheim, Jeremy Steinberger, Samuel Hunter, Sean N. Neifert, Brian C. Deutch, Jonathan S. Gal, John M. Caridi

3:57–4:03 pm

160 Normal Pressure Hydrocephalus Medicare Expenditures (2006-2010)

Tito Vivas-Buitrago, Alessandra Rigamonti, Gabriel D. Pinilla-Monsalve, Kathryn A. Carson, Phoebe Sharkey, Jamie Robison, Ignacio Jusué-Torres, Gwendolyn Clemens, Abanti Sanyal, Jamie Hoffberger, Eric W. Sankey, Jennifer Lu, Atif Adams, Daniele Rigamonti

4:03–4:09 pm

161 Association Between Pre-Operative Narcotic Use with Surgical Outcomes, Patient Reported Pain Scores and Ambulatory Status After Complex Spinal Fusion (>=5 Levels) for Adult Deformity Correction

Aladine A. Elsamadicy, Nicolas Drysdale, Amanda Sergesketter, Syed Adil, Lefko Charalambous, Theresa Williamson, Joaquin Q. Camara-Quintana, Muhammad M. Abd-El-Barr, C. Rory Goodwin, Isaac O. Karikari

4:09–4:15 pm

162 Reserved Bed Pilot Program Increases Transfer Volume and Improves Capacity Strain in a Large Neurosciences Intensive Care Unit

Christopher D. Shank, Nicholas J. Erickson, Beverly C. Walters

Section on Disorders of the Spine and Peripheral Nerves Oral Presentations

2:45–2:51 pm

163 Anterior Cervical Discectomy and Fusion in the Outpatient Ambulatory Surgery Setting: Analysis of 2000 Consecutive Cases

Matthew J. McGirt, Vincent Rossi, David Peters, E. Hunter Dyer, Tim E. Adamson, Domagoj Coric, Anthony L. Asher

2:51–2:57 pm

164 The Correlation of ODI and the 4-Question Scales for Pain and Physical Function from PROMIS

Brandon W. Smith, Jacob R. Joseph, Yamaan S. Saadeh, Jay K. Nathan, Michael Kirsch, David Nerenz, Victor W. Chang, Jason M. Schwalb, Muwaffak Abdulhak, Paul Park

2:57–3:03 pm

165 Durability of Satisfactory Functional Outcomes Following Surgical Adult Spinal Deformity Correction: A 3-Year Survivorship Analysis

Peter G. Passias, Cole Bortz, Virginie Lafage, Renaud Lafage, Justin S. Smith, Breton G. Line, Robert Eastlack, Munish C. Gupta, Richard A. Hostin Jr., Samantha R. Horn, Daniel M. Sciubba, Jeffrey L. Gum, Khaled Kebaish, Eric Klineberg, Douglas C. Burton, Frank Schwab, Christopher I. Shaffrey, Christopher P. Ames, International Spine Study Group (ISSG), Muhammad Janjua

3:03–3:09 pm

166 Is Achieving Optimal Spinopelvic Parameters Necessary to Obtain Substantial Clinical Benefit: Analysis of Patients Who Underwent Circumferential MIS or Hybrid Surgery With Open Posterior Instrumentation

Paul Park, Robert Eastlack, Kai-Ming G. Fu, Stacie Tran, Gregory M. Mundis Jr., Juan S. Uribe, Michael Y. Wang, Khoi D. Than, David O. Okonkwo, Adam S. Kanter, Pierce D. Nunley, Neel Anand, Richard G. Fessler, Dean Chou, Praveen V. Mummaneni, International Spine Study Group

3:15–3:21 pm

168 Decompression Versus Fusion for Grade 1 Lumbar Spondylolisthesis: A Multicenter Assessment of 12-Month Patient Reported Outcomes Using the Quality Outcomes Database

Jian Guan, Mohammed A. Alvi, Anthony L. Asher, Mohamad Bydon, Andrew Kai-Hong Chan, Kevin T. Foley, Steven D. Glassman, Panagiotis Kerezoudis, John J. Knightly, Praveen V. Mummaneni, Paul Park, Eric A. Potts, Mark E. Shaffrey, Jonathan Slotkin, Michael S. Virk, Michael Y. Wang, Erica F. Bisson

3:21–3:27 pm

169 Similar Proportions Return to Work Following Fusion and Decompression Alone for Degenerative Grade 1 Lumbar Spondylolisthesis, Though the Trajectories Differ: An Analysis of the Quality Outcomes Database

Andrew Kai-Hong Chan, Erica F. Bisson, Mohamad Bydon, Steven D. Glassman, Kevin T. Foley, Eric A. Potts, Christopher I. Shaffrey, Mark E. Shaffrey, Domagoj Coric, Michael Y. Wang, John J. Knightly, Paul Park, Kai-Ming G. Fu, Jonathan Slotkin, Anthony L. Asher, Michael S. Virk, Panagiotis Kerezoudis, Jian Guan, Anthony M. DiGiorgio, Catherine Miller, Regis W. Haid Jr., Praveen V. Mummaneni

3:27–3:33 pm

170 Overlapping Spine Surgery: A Retrospective Cohort Study of 90-day Complications

James G. Malcolm, Osama Kashlan, Jason J. Lamanna, Brian M. Howard, Daniel Refai

3:33–3:39 pm

171 The Safety and Efficacy of Early Surgery for Traumatic Central Cord Syndrome

Jetan H. Badhiwala, Blessing N.R. Jaja, Fan Jiang, Farshad Nassiri, Christopher D. Witiw, Muhammad Akbar, Robert G. Grossman, Jefferson R. Wilson, Michael G. Fehlings

3:39–3:45 pm

172 Role of the Sodium/Glutamate Blocker Riluzole in Enhancing Functional Outcomes in Patient Undergoing Surgery for Degenerative Cervical Myelopathy: Results of the Prospective, Multicentre Double Blind Controlled CSM-Protect Randomized Controlled Trial

Michael G. Fehlings, Branko Kopjar, Henry Ahn, Francis Farhadi, Christopher I. Shaffrey, Ahmad Nassr, Praveen V. Mummaneni, Paul M. Arnold, Bradley Jacobs, K. Daniel Riew, Darrel S. Brodke, Alexander R. Vaccaro, Alan S. Hilibrand, Jason D. Wilson, James S. Harrop, S. Tim Yoon, Kee Kim, Daryl R. Fourney, Carlo Santaguida

3:45–3:51 pm

173 The Role of Physical Therapy on Time to Discharge after Lumbar Interbody Fusion

Mohamed Macki, Hesham M. Zakaria, Lara W. Massie, Victor W. Chang

3:51–3:57 pm

174 Minimally Invasive Surgical Treatment of Metastatic Epidural Spinal Cord Compression (MESCC): An Algorithm-Based Approach

Mohammed A. Alshareef

3:57–4:03 pm

175 Outcome Analysis of Long-Term Cancer Survivors Surgically Treated for Symptomatic Spinal Metastases

Ori Barzilai, Mclaughlin Lily, Eric Lis, Yoshiya Josh Yamada, Mark H. Bilsky, Ilya Laufer

4:03–4:09 pm

176 Malignant Primary Spinal Column Tumors: Prognostic Significance of HTERT (Human Telomerase Reverse Transcriptase) Promoter Region Mutations C228T and C250T for Overall Survival

Chetan Bettegowda, Stephen Yip, Bowen Jiang, Wei-Lien Wang, Michelle J. Clarke, Aron Lazary, Marco Gambarotti, Ming Zhang, Daniel M. Sciubba, Jean-Paul Wolinsky, Edward McCarthy, Niccole Germscheid, Arjun Sahgal, Ziya L. Gokaslan, Stefano Boriani, Peter Varga, Charles Fisher, Laurence D. Rhines, AOSpine Knowledge Forum Tumor

4:09–4:15 pm

177 Genetic Predictors of Local Failure Following Conventional Radiation Therapy for Spine Metastases

Dennis T. Lockney, Erik S. Anderson, Natalie Lockney, Robert Samstein, Daniel Higginson, Yoshiya Josh Yamada, Mark H. Bilsky, Ilya Laufer, Adam Schmitt

Section on Neurotrauma and Critical Care Oral Presentations

2:45–2:51 pm

178 Comparison of Outcomes in Level I Versus Level II Trauma Centers in Patients Undergoing Craniotomy or Craniectomy for Severe Traumatic Brain Injury

Nohra Chalouhi, Fadi Al Saiegh, Robert M. Starke, Jack Jallo

2:51–2:57 pm

179 To Scan or Not to Scan: The Role of Follow-up CT Scanning for Management of Chronic Subdural Hematoma After Neurosurgical Evacuation (TOSCAN)—A Randomised, Controlled Trial

Philippe Schucht, Urs Fischer, Christian Fung, Corrado Bernasconi, Jens Fichtner, Sonja Vulcu, Daniel Schöni, Andreas Nowacki, Stefan Wanderer, Christian Eisenring, Anna-Katharina Jetzer, Nicole Soell, Luca Tochtermann, Werner Z'Graggen, Andreas Raabe, Juergen Beck

2:57–3:03 pm

180 Recovery Trajectories and Long-Term Outcomes in Traumatic Brain Injury: A Secondary Analysis of the Phase 3 COBRIT Clinical Trial

Ross Puffer, John K. Yue, Julia Billigen, Jane Sharpless, Anita Lynn Fetzick, Ava Puccio, Ramon Diaz-Arrastia, David O. Okonkwo

3:03–3:09 pm

181 Therapeutic Application of Autologous Bone Marrow Mononuclear Stem Cell in Complete Spinal Cord Injury in Human

Renu Saini

3:09–3:15 pm

182 Impact of ICP Monitoring Type on Outcomes of Severe Traumatic Brain Injury—Experience of Two Academic Institutions over Eight Years

Maya Harary, Rianne G.F. Dolmans, Brittany M. Stopa, Saef Izzy, Rebekah Mannix, William B. Gormley

3:15–3:21 pm

183 Outcomes of Severe Traumatic Brain Injury Treated With or Without Intracranial Pressure Monitoring

Fadi Al Saiegh, Nohra Chalouhi, Nikolaos Mouchtouris, Jack Jallo

3:21–3:27 pm

184 A Novel Neurosurgical DVT Prediction Model

David L. Dornbos III, Varun Shah, Ammar Shaikhouni, Blake Priddy, Victoria Schunemann, Shahid Mehdi Nimjee, Ciaran J. Powers

3:27–3:33 pm

185 Admission Disposition and Cost Savings for Mild Traumatic Brain Injury

Wesley H. Jones, Panayotis Apokremiotis, Phillip Choi, Ryan S. Kitagawa

3:33–3:39 pm

186 Degree of Midline Shift at Presentation Affects Long-Term Outcomes in Cases of Traumatic Brain Injury: A Secondary Analysis of the Phase 3 COBRIT Clinical Trial

Ross Puffer, John K. Yue, Matthew Mesley, Julia Billigen, Jane Sharpless, Anita L. Fetzick, Ava Puccio, Ramon Diaz-Arrastia, David O. Okonkwo

3:39–3:45 pm

187 Could Transient Neurological Symptoms with Subdural Hematoma be Explained by Cortical Spreading Depolarization Activity in Neurons (CT-SCAN)

Mathieu Levesque, Christian Bocti, François Moreau, Caroline Vézina, Christian Iorio-Morin, Charles Deacon

3:45–3:51 pm

188 Third Delay in TBI: Time to Assessment as a Vital Predictor of Mortality

Saksham Gupta, Monty Khajanchi, Vineet Kumar, Nakul Raykar, Blake Alkire, Nobhojit Roy, Kee B. Park

3:51–3:57 pm

189 Decreased Distance from Midline in Decompressive Craniectomy Predicts Development of Hydrocephalus

John R. Williams, R. Michael Meyer, Jocelyn Richard, Randall M. Chesnut

3:57–4:03 pm

190 Incremental Prognostic Value of the Activated Partial Thromboplastin Time and Creatinine in Addition to the Crash Score in Traumatic Brain Injury Patients

Davi Jorge Fontoura Solla, Robson L. Amorim, Manoel Jacobsen Teixeira, Wellington S. Paiva

4:03–4:09 pm

191 Treatment Strategy for Brain Contusion in Patients with Traumatic Brain Injury—First ICP Monitoring or First Operation: A Large Cohort Study

Qiang Yuan

4:09–4:15 pm

THINKFIRST INJURY PREVENTION RESEARCH AWARD

192 Effect of Bicycle Helmet use on Traumatic Brain and Cervical Spine Injuries: A 5 Year Review

Paul Page, Daniel Burkett, Nathaniel P. Brooks

Section on Pain Oral Presentations

3:27–3:33 pm

193 Thermode-Guided External Low Frequency Focused Ultrasound Modulation of Vincristine Induced Neuropathy

Abigail Hellman, Teresa Maietta, Tarun Prabhala, Paul Neubauer, Rebecca Keller, Clif Burdette, Julie G. Pilitsis

3:33–3:39 pm

194 Opiate-Free Pain Therapy Using Carbamazepine-Loaded Microparticles Provides up to Two Weeks of Pain Relief in a Neuropathic Pain Model

Haining Dai, Dana Tilley, Greici Mercedes, Chris Doherty, Amitabh Gulati, Neel Mehta, Amer Khalil, Francis M. Reynolds

3:39–3:45 pm

195 Impact of Elective Spine Surgery on Opioid Utilization in Patients with Chronic Pain

Anthony Nguyen, Evan Ross, Rishi R. Lall, Juan R. Ortega-Barnett

3:45–3:51 pm

196 Enhancing Neuromodulation-Induced Analgesia Through Personalized Neuro-Visual Stimulation

Vibhor Krishna, Marco Solca, Andrea Serino, Thomas Geist, Nicole Young, Ali R. Rezai, Olaf Blanke

3:51–3:57 pm

197 Prescription Drug Monitoring Programs and the Neurosurgeon: Impact on Workflow and Overall Perceptions

Maya A. Babu, Brian V. Nahed, Robert F. Heary

3:57–4:03 pm

198 The Importance of Somatotopy to Achieve Clinical Benefit in Motor Cortex Stimulation for Pain Relief

Afif M. Afif, Luis Garcia-Larrea, Patric Mertens

4:03–4:09 pm

199 Protocolization of Post-Transforaminal Lumbar Intervertebral Fusion Pain Control with Elimination of Benzodiazepines and Long-Acting Opioids

Jason H. Boulter, Brian P. Curry, Matthew C. Welch, Joseph Spinelli, Charles A. Miller, Chris J. Neal, Christopher Spevak, Randy S. Bell

4:09–4:15 pm

200 The Treatment of Chronic Cluster Headache with Deep Brain Stimulation of the Posterior Hypothalamus

Nilson N. Mendes Neto, Jessika Thais da Silva Maia, Juliano Jose da Silva, Sergio Adrian Fernandes Dantas, Marcelo Rodrigues Zacarkim, Daniel Duarte Rolim, Erich T. Fonoff

Section on Pediatric Neurological Surgery Oral Presentations

2:45–2:51 pm

201 Analysis of Surgical Management of Subdural Hematoma in Pediatric Abusive Head Trauma

Vincent Nguyen, Olutomi T. Akinduro, David A. Wallace, Sonia Ajmera, Michael G. DeCuyper, Paul Klimo Jr.

2:51–2:57 pm

202 Pupillary Changes after Non-Concussive High-Acceleration Head Impacts in High School Football Athletes

Jacob R. Joseph, Jennylee S. Swallow, Kylene Willsey, Andrew P. Lapointe, Kathryn O'Connor, Nicholas J. Szerlip, Steven P. Broglio

2:57–3:03 pm

203 Evaluation of Lateral Atlantodental Interval Asymmetry in the Pediatric Age Group: Normative Values

Stephen K. Mendenhall, Andrew Huh, Vincent J. Alentado, Karl E. Balsara, Andrew H. Jea

3:03–3:09 pm

204 Predictors of Spinal Fusion Within Two Years of Posterior Fossa Decompression in Patients with Chiari Malformation Type 1 and Scoliosis: A Multi-Institutional Experience with the Park-Reeves Syringomyelia Research Consortium

Steve H. Monk, Shilin Zhao, Jennifer Strahle, Christine Averill, Daniel E. Couture, James M. Johnston Jr., Michael P. Kelly, James Torner, Tae Sung Park, David D. Limbrick Jr., Christopher M. Bonfield, Chevis N. Shannon

3:09–3:15 pm

205 Pediatric Occipital Condyle Morphometric Analysis Using Computed Tomography with Evaluation for Occipital Condyle Screw Placement

Khoi D. Nguyen, Angela Viers, Jonathan A. Tuttle, Ian M. Heger

Section on Stereotactic and Functional Neurosurgery Oral Presentations

3:33–3:39 pm

206 Dynamic Stimulation of Human Visual Cortex Produces Useful Percepts of Visual Forms in Sighted and Blind Subjects

Daniel Yoshor, William H. Bosking, Brett L. Foster, Ping Sun, Soroush Niketeghad, Sameer A. Sheth, Robert Greenberg, Nader Pouratian, Michael S. Beauchamp

3:39–3:45 pm

207 Stereotactic Radiosurgical Capsulotomy for Obsessive-Compulsive Disorder: Initial Results Using a “Goldilocks” 5-Shot Radiosurgical Plan

Sameer A. Sheth, Yagna Pathak, Ian Paddick, Deepti Anbarasan, Tony J. C. Wang, Antonio Lopes, Marcelo Q. Hoexter, Benjamin Greenberg, Steve Rasmussen, Euripedes Miguel, Nicole McLaughlin, Garrett P. Banks

3:45–3:51 pm

208 Inferior Thalamic Peduncle Deep Brain Stimulation for Treatment-Refractory Obsessive-Compulsive Disorder: A Phase 1 Pilot Trial

Darrin J. Lee, Robert Dallapiazza, Philippe De Vloo, Gavin Elias, Anton Fomenko, Peter Giacobbe, Andres M. Lozano

3:51–3:57 pm

209 Radiosurgical Management of Patients with Persistent or Recurrent Cushing’s Disease after Prior Transsphenoidal Surgery: A Management Algorithm Based on a 25-year Experience

Joshua D. Hughes, William F. Young Jr., Alice Y. Chang, Michael J. Link, Yolanda I. Garces, Nadia Laack, Geoffrey B. Thompson, Bruce E. Pollock

3:57–4:03 pm

210 Ventro-Lateral Motor Thalamus Abnormal Connectivity in Essential Tremor Before and After Stereotactic Radiosurgical Thalamotomy: A Resting-State fMRI Study

Constantin Tuleasca, Jean Regis, Elena Najdenovska, Tatiana Witjas, Nadine Girard, Jerome Champoudry, Mohamed Faouzi, Jean-Philippe Thiran, Meritxell Bach Cuadra, Marc Levivier, Dimitri Van De Ville

4:03–4:09 pm

211 Pretherapeutic Functional Neuroimaging Predicts Tremor Arrest After Stereotactic Radiosurgical Thalamotomy

Constantin Tuleasca, Jean Regis, Elena Najdenovska, Tatiana Witjas, Nadine Girard, Jerome Champoudry, Mohamed Faouzi, Jean-Philippe Thiran, Meritxell Bach Cuadra, Marc Levivier, Dimitri Van De Ville

4:09–4:15 pm

212 Visual, Salience, and Motor Networks are Related to Tremor Recovery After Stereotactic Radiosurgical Thalamotomy: A Resting-State fMRI Study

Constantin Tuleasca, Jean Regis, Elena Najdenovska, Tatiana Witjas, Nadine Girard, Jerome Champoudry, Jean-Philippe Thiran, Meritxell Bach Cuadra, Marc Levivier, Dimitri Van De Ville

Section on Tumors Oral Presentations

3:30–3:36 pm

AMERICAN BRAIN TUMOR ASSOCIATION YOUNG INVESTIGATOR AWARD

213 Radiomic Machine Learning Algorithms Discriminate Pseudo-Progression from True Progression in Glioblastoma Patients: A Multi-Institutional Study

Pascal O. Zinn, Srishti Abrol, Aikaterini Kotrotsou, Ahmed Hassan, Nabil Elshafeey, Tagwa Idris, Naveen Manohar, Islam Hassan, Kamel Salek, Nikdokht Farid, Carrie McDonald, Shiao-Pei Weathers, Naeim Bahrami, Samuel Bergamaschi, Ahmed Elakkad, Kristin Alfaro-Munoz, Fanny Moron, Jason Huse, Jeffrey S. Weinberg, Sherise D. Ferguson, Evangelos Kogias, Amy B. Heimberger, Raymond Sawaya, Ashok Mahapatra Kumar, John de Groot, Meng Law, Rivka R. Colen

3:36–3:42 pm

JOURNAL OF NEURO-ONCOLOGY AWARD

214 Non-Invasive Monitoring of Immunotherapeutic Responses in Glioblastoma Using Novel Imaging Techniques

Joseph P. Antonios, Horacio Soto, Richard G. Everson, Anthony C. Wang, Jacob Bethel, Caius Radu, Benjamin Ellingson, Michael Phelps, Timothy F. Cloughesy, Robert M. Prins, Linda M. Liau

3:42–3:48 pm

AANS/CNS JS TUMOR NEURO-ONCOLOGY TRAINEE AWARD

215 The Impact of Intraoperative MRI and Other Factors on Survival for Patients with Newly Diagnosed Glioblastoma: A Multi-Center Assessment of Over 800 Patients

Amar S. Shah, Peter Sylvester, Ananth K. Vellimana, Gavin P. Dunn, John Evans, Randy L. Jensen, John H. Honeycutt, Garnette R. Sutherland, Daniel P. Cahill, Mitesh V. Shah, Steven R. Abram, Mark C. Oswood, Albert H. Kim, Eric C. Leuthardt, Joshua L. Dowling, Keith M. Rich, Ralph G. Dacey Jr., Gregory J. Zipfel, Yu Tao, Michael R. Chicoine

3:48–3:54 pm

PREUSS RESEARCH BRAIN TUMOR AWARD

216 Cerebrospinal Fluid (CSF) Can Inhibit Wound Healing and Induce CSF Leaks by Inhibiting Angiogenesis

Ezequiel Goldschmidt, David Gau, Meghan Schneck, Partha Roy, Paul A. Gardner

3:54–4:00 pm

COLUMBIA SOFTBALL PEDIATRIC BRAIN TUMOR AWARD

217 Precision Sequencing Algorithm in Pediatric Neurosurgery

Jeffrey P. Greenfield, Uday Maachani, Birra Taha, Rohan Bareja, Kenneth Wang, Andreas Sboner, Therese Haussner, Caitlin E. Hoffman, Christopher E. Mason, Mark M. Souweidane, Olivier Elemento, David Pisapia, Prajwal Rajappa

4:00–4:06 pm

218 Divergent Clonal Evolution of Melanoma Brain Metastases in Response to Immunotherapy

Christopher Alvarez-Breckenridge, Jackson Stocking, Matt Lastrapes, Naema Nayyar, Corey M. Gill, Mia Bertalan, Alexander Kaplan, Devin McCabe, Craig Horbinski, Rasheed Zakaria, Farshad Nassiri, Gelareh Zadeh, Maria Martinez-Lage Alvarez, Brian V. Nahed, William T. Curry Jr., Benjamin Izar, Mario Suva, Ryan Sullivan, Daniel P. Cahill, Scott Carter, Priscilla Brastianos

4:06–4:12 pm

219 Probability Maps of Glioblastoma Indicate Variation in Surgical Decisions between 10 Surgical Teams

Domenique Mueller, Pierre Alain Robe, Wimar van den Brink, Hilko Ardon, Bas Idema, Alfred Kloet, Frederik Barkhof, William P. Vandertop, Lorenzo Bello, Georg Widhalm, Emmanuel Mandonnet, Mitchel S. Berger, Philip C. De Witt Hamer

TU

Sunrise Science Oral Presentations Session 1

7:00–7:06 am

300 Usefulness of Intraoperative Visual Function Monitoring During Neurosurgical Procedures

Roser Garcia-Armengol, Alicia Martinez-Piñeiro, Belen Menendez, Kaoutar Mekkaoui, Cristina Hostalot, Jordi Manuel de Rimbau

7:06–7:12 am

301 Antitumor Efficacy of Anti-PDL-1 In ACTH-secreting Pituitary Adenomas: A Novel Immunotherapeutic Approach For Cushing's Disease

Hanna Kemeny, Aladine A. Elsamadicy, S. Harrison Farber, Pakawat Chongsathidkiet, Cosette Dechant, Steven Shen, Ian F. Dunn, Peter E. Fecci

7:12–7:18 am

302 Corticosteroid Use and Its Relation to Post-Operative Edema in Magnetic Resonance Guided Laser Induced Thermal Therapy for Recurrent Metastatic Brain Tumors

Brain Morris, Arthur Carminucci, Shabbar F. Danish

7:18–7:24 am

303 Use of 5-Aminolevulinic Acid as an Immediate Intraoperative Indicator to Guide Malignant Primary Brain Tumors in Frameless Stereotactic Biopsies

Roser Garcia-Armengol, Ferran Brugada, Patricia Cuadras, Cristina Hostalot, Carlos Javier Dominguez Alonso, Jordi Manuel de Rimbau

7:24–7:30 am

304 Safety of Laser Ablation for Brain Tumors: Preliminary Results from the Laser Ablation of Abnormal Neurological Tissue Using Robotic NeuroBlate System (LAANTERN) Registry

Ashwin A. Kamath, Albert H. Kim, Clark C. Chen, Stephen B. Tatter, Peter Fecci, Brian Toyota, Veronica Chiang, Alireza M. Mohammadi, Ganesh Rao, Kevin D. Judy, Melvin Field, Andrew E. Sloan, Joseph Samir Neimat, Eric C. Leuthardt

7:30–7:36 am

305 Lymphopenia Predicts Response to Stereotactic Radiosurgery for Brain Metastases in Lung Cancer Patients

Yuping D. Li, Jason Lamano, Gurvinder Kaur, Jonathan B. Lamano, Dorina Veliceasa, Dauren Biyashev, Orin Bloch

7:36–7:42 am

306 Postoperative Navigated Transcranial Magnetic Stimulation to Predict Motor Recovery After Surgery of Tumors Located in Motor Eloquent Areas

Kathleen Seidel, Levin Häni, Katharina Lutz, Chantal Zbinden, Annetta Redmann, Alberto Consuegra, Andreas Raabe, Philippe Schucht

7:42–7:48 am

307 Stereotactic Radiosurgery for Pediatric Intracranial Ependymomas: An International Multicenter Study

Hideyuki Kano, Yan-Hua Su, Hsiu-Mei Wu, Gabriela Simonova, Roman Liscak, Or Cohen-Inbar, Jason P. Sheehan, Antonio Meola, Mayur Sharma, Gene H. Barnett, David Mathieu, Lucas T. Vasas, Anthony M. Kaufmann, Rachel C. Jacobs, L. Dade Lunsford

7:48–7:54 am

308 Metabolic Isozyme Switching Offers a Targeted Treatment Strategy in Cushing's Disease

Jacqueline Boyle, Konstantinos V. Floros, Jie Lu, Grégoire P. Chatain, Dragan Maric, Abhik R. Chaudhury, Prashant Chittiboina

7:54–8:00 am

309 Highly Sensitive Detection of the IDH1 R132H Mutation in the Plasma of Glioma Patients

Leonora Balaj, Bob S. Carter, Elena Castellanos-Rizaldos, Pier Paolo Peruzzi, Dalin Chan, Xuan Zhang, Johan Skog

CV

Sunrise Science Oral Presentations Session 2

7:00–7:06 am

310 Increased Rate of Subarachnoid Hemorrhage in Polycystic Kidney Disease Despite Screening

D. Andrew Wilkinson, James F. Burke, Jeffrey L. Nadel, Cormac O. Maher, Neeraj Chaudhary, Joseph J. Gemmete, Micheal Heung, Byron G. Thompson Jr., Aditya S. Pandey

7:06–7:12 am

311 Radiation-Induced Changes After Stereotactic Radiosurgery for Brain Arteriovenous Malformations: A Systematic Review and Meta-Analysis

Adeel Ilyas, Ching-Jen Chen, Dale Ding, Thomas Buell, Daniel Raper, Cheng-Chia Lee, Zhiyuan Xu, Jason P. Sheehan

7:12–7:18 am

312 Intraoperative Imaging of Cerebral Vasculature and Blood Flow Using Confocal Laser Endomicroscopy: New Perspectives in Precise Real-Time Brain Fluorescence Microimaging

Evgenii Belykh, Claudio Cavallo, Xiaochun Zhao, Michael T. Lawton, Peter Nakaji, Mark C. Preul

7:18–7:24 am

313 Anemia After Aneurysmal Subarachnoid Hemorrhage is Associated with Poor Outcome and Death

Oliver G.S. Ayling, George Ibrahim, Naif M. Alotaibi, Peter A. Gooderham, R. Loch Macdonald

7:24–7:30 am

314 S1P Signaling in Neuronal Apoptosis, Links to Resistance and Vulnerability to Ischemic Induced Neuronal Cell Death

Sherif Rashad, Kuniyasu Niizuma, Mika Sato-Maeda, Daisuke Saigusa, Teiji Tominaga

7:30–7:36 am

315 Comparative Effectiveness Analysis of Pipeline Embolization Device (PED) Versus Coiling in Unruptured Aneurysms Less Than 10-mm in Size

Xiao Wu, Branden J. Cord, Samuel A. C. Sommaruga, Charles C. Matouk, Ajay Malhotra

7:36–7:42 am

316 Screening for Intracranial Aneurysms in Patients with Autosomal Dominant Polycystic Kidney Disease (ADPKD): A Cost Effectiveness Analysis

Xiao Wu, Charles C. Matouk, Ajay Malhotra

7:42–7:48 am

317 Prevalence of Thoracic Aneurysms or Dilatations in Patients with the Intracranial Aneurysms

Dan Laukka, Emily Pan, Terhi Fordell, Kemal Alpay, Melissa Rahi, Jussi Hirvonen, Jaakko Rinne, Jarmo Gunn

7:48–7:54 am

318 Detection of Ependymal Cilia in Cerebrospinal Fluid of Aneurysmal-Pattern Subarachnoid Hemorrhage

Kyle Schmidt, Michael Price, Andrew P. Gard, Daniel L. Surdell, Joseph Sisson, William E. Thorell

7:54–8:00 am

319 Middle Meningeal Artery Embolization for Chronic Subdural Hematoma: A Series of 57 Cases

Thomas W. Link, Hooman Kamel, Jared Knopman

SP

Sunrise Science Oral Presentations Session 3

7:00–7:06 am

320 Enhanced Recovery Protocol for Lumbar Fusion: A Comparative Single Institution Experience

G. Damian Brusko, Karthik Madhavan, Richard Epstein, John Paul G. Kolcun, Jay Grossman, Michael Y. Wang

7:06–7:12 am

321 Back Pain in Surgically Treated Degenerative Lumbar Spondylolisthesis: What Can We Tell Our Patients

Michael Bond, Hanbing Zhou, Nicolas Dea, Christopher Bailey, Raphael Charest-Morin, Andrew Glennie, Neil Manson, Hamilton Hall, Kenneth Thomas, Y. Raja Rampersaud, Greg McIntosh, Charles Fisher

7:12–7:18 am

322 Relationship of Psoas Muscle Volume to Survival in Operative Metastatic Spine Tumor Patients

Yamaan S. Saadeh, Jacob R. Joseph, Brandon W. Smith, Jamaal K. Tarpeh, Jesse K. Kelley, Nicholas J. Szerlip, Paul Park

7:18–7:24 am

323 Healthcare Utilization and Bundled Payment Reimbursement for Patients Undergoing Anterior and Posterior Procedures for Degenerative Cervical Radiculopathy

Ahmad Alhourani, Mayur Sharma, Beatrice Ugiliweneza, Miriam Nuno, Doniel Drazin, Maxwell Boakye

7:24–7:30 am

324 The Applicability of Cervical Sagittal Vertical Axis, Lordosis, and T1-Slope on Pain and Disability Outcomes After Anterior Cervical Discectomy and Fusion

Darryl Lau, Anthony Digorgio, Andrew Kai-Hong Chan, Michael S. Virk, Dean Chou, Erica F. Bisson, Praveen V. Mummaneni

7:30–7:36 am

325 Impact of Obesity on Outcomes Following Lumbar Spine Surgery: A Systematic Review and Meta-Analysis

Anshit Goyal, Mohamed Elminawy, Panagiotis Kerezoudis, Yagiz U. Yolcu, Victor M. Lu, Mohammed A. Alvi, Waseem Wahood, Mohamad Bydon

7:36–7:42 am

326 The Impact of Surgeon Experience on Outcomes Following 3-Column Osteotomy for Adult Spinal Deformity: Overcoming the Learning Curve and Implementing Better Practices

Darryl Lau, Cecilia Dalle Ore, Vedat Deviren, Christopher P. Ames

7:42–7:48 am

327 Variation in Management of Spinal Glioblastoma Multiforme: Results from a National Cancer Registry

F.M. Moinuddin, Mohammed A. Alvi, Waseem Wahood, Anshit Goyal, Yagiz U. Yolcu, Mohamad Bydon

7:48–7:54 am

328 Predictors of Patient Satisfaction at 1 Year and 2 Years in Patients Undergoing Lumbar Surgery: Analysis from a Statewide Database

Mohamed Macki, Mohammed A. Alvi, Panagiotis Kerezoudis, Shujie Xiao, Lonni Shultz, Mohamad Bydon, Paul Park, Victor W. Chang

7:54–8:00 am

329 Prolonged Use of Narcotic following Lumbar Spine Surgery: Predictive Factors and Outcome Analysis

Lee Onn Chieng, Karthik Madhavan, Nahom T. Teferi, Michael Y. Wang, Steven Vanni

SE TR

Sunrise Science Oral Presentations Session 4

7:00–7:06 am

330 Socioeconomic Factors, Peri-Operative Complications, and 30-Day Readmission Rates Associated with Delayed Referral for Cranial Vault Reconstruction for Craniosynostosis

Amanda Sergesketter, Aladine A. Elsamadicy, Hanna Kemeny, Stephen C. Harward II, Kate Buretta Krucoff, Max O. Krucoff, Herbert E. Fuchs, Eric M. Thompson, Alexander Allori, Jeffrey Marcus, Carrie R. Muh

7:06–7:12 am

331 Early Warfarin Resumption Following Burr-Hole Drainage for Chronic Subdural Hematoma

Sung Mo Ryu, Jong-Soo Kim, Seung-Chyul Hong, Je Young Yeon

7:12–7:18 am

332 A Review of Industry Funding in Randomized Controlled Trials Published in the Neurosurgical Literature

Nickalus Khan

7:18–7:24 am

333 Thoracoabdominal Crush Injury Causes Increased Intracranial Pressure Resulting in Traumatic Brain Injury Detectable with Eye Tracking Technology and Blood Based Biomarkers

Daniel J. Rafter, Uzma Samadani

7:24–7:30 am

334 Interfacility Neurosurgical Transfers: An Analysis of Non-Traumatic Inpatient and Emergency Department Transfers with Implications for Improvements In Care

Michael Safaee, Ramin A. Morshed, Jordan Spatz, Sujatha Sankaran, Mitchel S. Berger, Manish K. Aghi

7:30–7:36 am

335 Predictors of Withdrawal of Care in Patients with Severe Traumatic Brain Injury: A Nationwide Analysis

Theresa Williamson, Jihad Abdelgadir, Jordan Komisarow, Peter A. Ubel, Aladine A. Elsamadicy, Beiyou Liu, C. Rory Goodwin, Nandan Lad

7:36–7:42 am

336 A Capitated Price-per-Procedure Purchasing Model for the Neuroendovascular Treatment of Intracranial Aneurysms Reduces Hospital Expenses

Benjamin M. Zussman, Suzanne Brett, Taylor Gasparovic, Tudor Jovin, Brian T. Jankowitz

7:42–7:48 am

337 Symptom Severity After High School Football-Related Concussion Varies by Time Point In a Season: An Initial Investigation

Benjamin L. Brett, Andrew W. Kuhn, Aaron M. Yengo-Kahn, Zachary Y. Kerr, Christopher M. Bonfield, Gary Solomon, Scott L. Zuckerman

7:48–7:54 am

338 Reduced Postoperative Pain and Narcotic Consumption with ERAS® TLIF: Comparison to Conventional MIS TLIF

John Paul G. Kolcun, Jean-Paul Bryant, G. Damian Brusko, Karthik Madhavan, Timur Urakov, Jay Grossman, Michael Y. Wang

7:54–8:00 am

339 Management of Blunt Cerebrovascular Injuries Simplified: Experience with an Aspirin-Based Approach

Joshua Catapano, Sharjeel Israr, Andrew F. Ducruet, Felipe Albuquerque, Alex Whiting, Nathan Rubalcava, Laura A. Snyder, Jordan Weinberg, Joseph M. Zabramski



Sunrise Science Oral Presentations Session 5

7:00–7:06 am

340 Convection-Enhanced Delivery of Macromolecules to the Brain Using Electrokinetic Transport

Amir H. Faraji, Andrea Jaquins-Gerstl, Alec C. Valenta, Yangguang Ou, R. Mark Richardson, Stephen G. Weber

7:06–7:12 am

341 Structural and Functional Insights into Topological Patterns of Networks in Patients with Advanced Parkinson's Disease

Jennifer Muller, Lucy Li, Sara Thalheimer, Mackenzie Silverman, Mahdi Alizadeh, Tsao-Wei Liang, Kelly Anne Layton, Daniel Kremens, Victor M. Romo, Feroze Mohamed, Chengyuan Wu

7:12–7:18 am

342 Chiari I Malformation: An Analysis of Surgical Risk Factors and Complications Using an International Database

Abhiraj D. Bhimani, Darian R. Esfahani, Steven Denyer, Ryan G. Chiu, David Rosenberg, Ashley L. Barks, Gregory D. Arnone, Ankit I. Mehta

7:18–7:24 am

343 Neural Correlates of Risky Decisions

Sarah K.B. Bick, Shaun Patel, Emad N. Eskandar

7:24–7:30 am

344 Deep Brain Stimulation in Multiple Rooms: a Single-Surgeon Retrospective Comparison of Overlapping and Non-Overlapping Electrode Placements

John P. Sheehy, Tsinsue Chen, Michael Bohl, Michael A. Mooney, Zaman Mirzadeh, Francisco A. Ponce

7:30–7:36 am

345 Vagus Nerve Stimulation Versus Responsive Neurostimulator System in Patients with Bilateral Temporal Lobe Epilepsy

Amy J. Wang, Sarah K.B. Bick, Ziv Williams

7:36–7:42 am

346 Dorsal Root Ganglion Stimulation for Ilioinguinal Neuralgia: A Case Series

Carli Bullis, Paxton A. Gehling, Ahmed M.T. Raslan

7:42–7:48 am

347 Alpha-Synuclein Induces the Unfolded Protein Response in Parkinson's Disease Patient-Specific SNCA Triplication iPSC-Derived Neurons

Sabrina M. Heman-Ackah

7:48–7:54 am

348 An Integrated Solution to Predict the Stimulation Parameters after STN DBS for PD

Vibhor Krishna, Francesco Sammartino, Qinwan Rabbani, Barbara K. Changizi, Punit Agrawal, Milind Deogaonkar, Michael V. Knopp, Nicole Young, Ali R. Rezai

7:54–8:00 am

349 Is Human Insular Cortex Involved in Preparing to Produce Speech

Oscar Woolnough, Kiefer Forseth, Nitin Tandon

Sunrise Science Oral Presentations Session 6

7:00–7:06 am

350 Factors Associated to Successful Vacuum-Assisted Elevation of Depressed Skull Fractures

Elsa V. Arocho-Quinones, Sean M. Lew, Andrew B. Foy

7:06–7:12 am

351 Long-Term Functional Outcome Following Selective Dorsal Root Rhizotomy for Spastic Cerebral Palsy—A Natural History-Matched Prospective Cohort with 15 Years Follow-up

Christian Iorio-Morin, Rita Yap, Chantal Poulin, Marie-Andrée Cantin, Thierry Benaroch, Jean-Pierre Farmer

7:12–7:18 am

352 Management Strategies for Hydrocephalus in Pediatric Posterior Fossa Brain Tumor

Amr M. Elkhatny, David Zurakowski, Liliana Goumnerova

7:18–7:24 am

353 Comparison of Ocular Outcomes in Pediatric Posterior Fossa Tumors

Nisha Gadgil, Katie Stormes, Veeral Shah, Sandi Lam

7:24–7:30 am

354 Topical Vancomycin for Surgical Prophylaxis in Non-Instrumented Pediatric Spinal Surgeries

Allen L. Ho, John Cannon, Jyodi Mohole, Arjun V. Pendharkar, Eric S. Sussman, Samuel Henry Cheshier, Gerald A. Grant

7:30–7:36 am

355 Novel Benchtop Model of Hydrocephalus to Study Ventriculo-Peritoneal Shunts

Noah L. Gorelick, Riccardo Serra, Rajiv Iyer, Henry Brem, Betty Tyler, Mark G. Luciano

7:36–7:42 am

356 Evaluation of Pediatric Glioma Outcomes Using Intraoperative MRI: A Multi-Center Cohort Study

Michael Karsy, Syed Hassan Akbari, David D. Limbrick Jr., Eric C. Leuthardt, John Evans, Matthew D. Smyth, Jennifer Strahle, Jeffrey R. Leonard, Douglas L. Brockmeyer, Robert J. Bollo, John R. Kestle, John H. Honeycutt, David J. Donahue, Richard A. Roberts, Daniel Hansen, Garnette R. Sutherland, Claire Gallagher, Walter Hader, Yves P. Starreveld, Mark G. Hamilton, Ann-Christine Duhaime, Randy L. Jensen, Michael R. Chicoine

7:42–7:48 am

357 Demographics and Characteristics of Hydrocephalus in Adults: The First 500 Subjects of the Adult Hydrocephalus Clinical Research Network Registry

Michael A. Williams, Mark G. Luciano, Sean J. Nagel, Norman Relkin, Thomas J. Zwimpfer, Heather Katzen, Richard Holubkov, Mark G. Hamilton

7:48–7:54 am

358 A Novel Determinant of Syrinx Formation in Patients with Chiari I Malformation

Catherine Peterson, Hassan Fadel, Bradley Kolb, Sandeep Sood

7:54–8:00 am

359 Intra-Operative mMEP Monitoring in 60 Children <2 Years of Age Undergoing Tethered Cord Surgery

Vedantam Rajshekhar, Mariappan Ramamani, Georgene Singh, Krothapalli Srinivas Babu



CONGRESS OF NEUROLOGICAL SURGEONS 2018 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 their field as well as 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 2018 CNS ANNUAL MEETING PARTICIPANTS WILL BE ABLE TO:

- › Modify their current practice patterns to reflect changes in clinical research or guidelines presented.
- › Recognize technical variations in surgical approaches discussed during interactive case sessions among peers.
- › Introduce and/or perform new techniques based on best practices, current procedures, and emerging surgical technologies.
- › Identify changes in the policy or economic environment of neurosurgical practice and the impact of these changes on patient care.
- › Interpret emerging data from scientific abstract presentations as foundations for future neurosurgical research.
- › Assess and track changes in practice quality and 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

Didactic and hands-on courses with expert neurosurgical educators demonstrating clinical techniques and applications via technology, models, and simulation. 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, October 6, and Sunday, October 7.

GENERAL SCIENTIFIC SESSION, SECTION SESSIONS, GUIDELINE SESSIONS, LUNCHEON SEMINARS, AND DINNER SEMINARS

Expert lecturers present research, scientific evidence and associated outcomes, and demonstrate 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. Basic skills and information that can be applied in daily practice and professional life are also presented.

- › General Scientific Sessions, Section Sessions, and Guideline Sessions are offered Sunday, October 7, through Wednesday, October 10.
- › Luncheon Seminars are offered Monday, October 8, through Wednesday, October 10.
- › Dinner Seminars are offered on Saturday, October 6, Monday, October 8, and Tuesday, October 9.

CASE-BASED EDUCATION

During the Case-based Discussion Sessions, the faculty presents cases to be examined, discussed, and debated by both the audience and panel. Registered attendees will have the opportunity to submit their own cases prior to the meeting to be presented at these sessions. Don't miss these interactive sessions designed to encourage participation from everyone.

- › Case-based Discussion Sessions will take place on Monday, October 8, and Tuesday, October 9.
- › Live Surgery via telemedicine technology in the Exhibit Hall will take place Monday, October 8, through Wednesday, October 10. 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 the CNS Poster Viewing will take place on Monday, October 8, and Tuesday, October 9.
- › Sunrise Science and Late-breaking Abstract Sessions by subspecialty Oral Presentations will take place on Monday, October 8, Tuesday, October 9, and Wednesday, October 10.
- › Late-breaking Abstracts will be presented on Tuesday, October 9, and Wednesday, October 10.



ACCREDITATION

The Congress of Neurological Surgeons is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

CME CREDIT

The CNS designates this live activity for a maximum of 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.

ADDITIONAL CME CREDITS CAN BE EARNED BY ATTENDING THE FOLLOWING:

Practical Courses

Attendees will receive a maximum of three-and-a-quarter (3.25) *AMA PRA Category 1 Credits*[™] for each Saturday half-day Practical Course, a maximum of seven (7) *AMA PRA Category 1 Credits*[™] for each eligible Saturday full-day Practical Course, a maximum of three-and-a-quarter (3.25) *AMA PRA Category 1 Credits*[™] for each eligible Sunday half-day Practical Course, and a maximum of seven (7) *AMA PRA Category 1 Credits*[™] for each eligible Sunday full-day Practical Course. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Luncheon Seminars

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

Dinner Seminars

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

Posters

Physicians may claim a maximum of five (5) *AMA PRA Category 1 Credits*[™] directly from the AMA for preparing a poster presentation, which is also included in the published abstracts. Physicians may claim them on their AMA PRA certificate application or apply directly to the AMA for an *AMA PRA Category 1 Credits*[™] certificate.

Physicians may claim *AMA PRA Category 2 Credits*[™] for viewing scientific posters. Physicians should self-claim credit on their AMA PRA certificate application form. Please visit the AMA web site for details at www.ama-assn.org.

CLAIMING CME CREDIT

CME credits can be claimed through the online CME system at www.cns.org. The CME tracking system allows you to create and print a CME certificate immediately following the CNS Annual Meeting while you are still in Houston, 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, reselling, or distributing health care 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.

FDA STATEMENT

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

AIRPORT

The CNS Annual Meeting hotels and the George R. Brown Convention Center are located approximately 10 miles from William P. Hobby (HOU) Airport and approximately 20 miles from George Bush Intercontinental (IAH) Airport. Taxis are readily available from each terminal curbside at both airports. Uber and Lyft are both also available in the Houston area.

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 either Scoot Around at 204-982-0657 or www.scootaround.com, or Wheelchair & Scooter Express at 713-942-2522 or www.wheelchairandscooterexpress.com. It is strongly suggested 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 2018 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@mcievents.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 Houston restaurants require coats and ties for gentlemen. Please check each restaurant's policy when making reservations.

CNS CENTRAL

Conveniently located adjacent to the CNS Registration Area, visit CNS Central with your questions on CNS membership, education, or CME. CNS staff will be available to assist you navigate our website, review our new case based Nexus product or download any CNS apps on your mobile devices. From accessing your favorite learning tools to discovering new ones, the CNS staff is here to help you with your questions about programs, products, and services!

CNS XPERIENCE LOUNGE

Immerse yourself in the best of the CNS Annual Meeting in the CNS Xperience Lounge! Get up close and personal with this year's awardees and special lecturers, connect with your colleagues and mentors, view digital posters, hear unique presentations, and get your hands on new technology featured throughout the meeting.

CHILDREN

Children over the age of 12 should register at the non-medical guest registration fee. (Please note that children under the age of 18 are not allowed in the Exhibit Hall.) Should you require babysitting services, please contact the concierge desk at your hotel. The CNS has no control over, and assumes no responsibility for, the care that is provided through hotels or these services. This information is provided solely to assist participants in identifying possible sources for childcare.

CLIMATE

October temperatures in Houston average a high of 82°F and a low of 59°F.

COURSE AGENDAS AND FACULTY

Agendas are occasionally subject to change. As we 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 CNS Xperience Lounge, located in the Exhibit Hall, and can be searched by author, topic, or keyword.

DISCLAIMER

The material presented at the 2018 Annual Meeting has been made available by the Congress of Neurological Surgeons for educational purposes only. The material is not intended to represent the only, nor necessarily the best, method or procedure appropriate for the medical situations discussed, but rather is intended to present an approach, view, statement, or opinion of the faculty which may be helpful to others who face similar situations. Neither the content (whether written or oral) of any course, seminar, or other presentation in the program, nor the use of a specific product in conjunction therewith, nor the exhibition of any materials by any parties coincident with the program, should be construed as indicating endorsement or approval of the views presented, the products used, or the materials exhibited by the CNS, or by its committees or affiliates. The CNS disclaims any and all liability for injury or other damages resulting to any individual attending the Annual Meeting, and for all claims which may arise out of the use of the techniques demonstrated therein by such individuals, whether these claims shall be asserted by physicians or any other person. No reproductions of any kind, including audiotapes and videotape, may be made of the presentations at the CNS Annual Meeting. The CNS reserves all of its rights to such material, and commercial reproduction is specifically prohibited.

EXHIBIT HALL

Monday, October 8	9:30 am–4:00 pm
Tuesday, October 9	9:30 am–3:00 pm
Wednesday, October 10	9:30 am–2:00 pm

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

FUTURE MEETINGS

2019: San Francisco, California	October 19–23
2020: Miami, Florida	September 12–16
2021: Austin, Texas	October 16–20

HOUSING INFORMATION

See pages 79–81 for detailed information.

REGISTRATION INFORMATION

Items included in registration fee:

- › Admission to General Scientific Sessions, Sunday—Wednesday
- › Scientific Program, including Section Sessions and Oral Presentations, Case-based Sessions, Sunrise Science and Late-breaking Abstract Sessions, Guidelines Sessions, Posters, and Digital Posters
- › Exhibit Hall Access, Monday—Wednesday
- › Access to the CNS Xperience Lounge
- › Industry Sponsored Lunch Symposia
- › One ticket to the Opening Reception on Sunday, October 7
- › Live Surgeries in the Exhibit Hall

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/2018, or by calling 847-240-2500. Once onsite, media are required to check in at the CNS registration area to pick up their press badges, and then proceed to the Press Room to pick up their press kits.

REGISTRATION AND CNS CENTRAL HOURS:

Saturday, October 6	7:00 am–5:30 pm
Sunday, October 7	7:00 am–7:00 pm
Monday, October 8	6:30 am–6:30 pm
Tuesday, October 9	6:30 am–6:30 pm
Wednesday, October 10	6:30 am–1:45 pm

SMOKING

The George R. Brown Convention Center and official CNS hotels are non-smoking facilities.

SPEAKER READY ROOM

All speakers and abstract presenters should visit the Speaker Ready Room in room 340A/B at the George R. Brown Convention Center no less than two hours prior to their presentations.

Saturday, October 6	7:00 am–4:30 pm
Sunday, October 7	7:00 am–6:30 pm
Monday, October 8	6:30 am–5:00 pm
Tuesday, October 9	6:30 am–5:00 pm
Wednesday, October 10	6:30 am–1:00 pm

SPOUSE HOSPITALITY SUITE

All registered CNS Annual Meeting spouses and guests are invited to visit the CNS Spouse Hospitality Suite at the Marriott Marquis Houston, Monday through Wednesday, from 8:00–10:30 am for continental breakfast. Please note that admittance to the Spouse Hospitality Suite is by spouse/guest badge only. A representative from the Greater Houston Convention and Visitors Bureau will be available at the CNS Spouse Hospitality Suite on Monday, October 8, to offer lunch/dinner recommendations and activity/tour options to spouses and guests.

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. For information on the visa process, including wait times, please visit <https://travel.state.gov/content/travel/en/us-visas.html>.

WI-FI SERVICE

For your convenience, complimentary Wi-Fi service is provided throughout the George R. Brown Convention Center and the Marriott Marquis Houston wherever CNS events are being held.

Registration Methods

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

ONLINE

cns.org/2018

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 George R. Brown Convention Center.

REGISTRATION RATES	ADVANCE REGISTRATION (prior to September 6)	AFTER SEPTEMBER 6, 2018
MEMBER REGISTRANT		
Active (Domestic)	\$ 750	\$ 950
International	\$ 750	\$ 950
Associate	\$ 750	\$ 950
Active Duty Military	\$ 0	\$ 0
Armed Forces (Guard/Reserve/Retiree)	\$ 475	\$ 675
Transitional	\$ 750	\$ 950
Resident (Domestic)	\$ 150	\$ 250
International Vista Resident	\$ 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
ANSPA Member ^{††}	\$ 575	\$ 675

Non-member registration categories are open to domestic and international registrants.

*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.
**All non-member residents must have their Program Director sign their registration form. If registering online, a letter from their Program Director certifying that they are a resident in a neurosurgical training program must be faxed to 972-349-7715, or e-mailed to cns@mcievents.com within one week of completing registration.
***All non-member fellows must provide a letter from their Chief of Service verifying fellow status within one week of completing registration. It may be faxed to 972-349-7715, or emailed to cns@mcievents.com.
[†]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.
^{††}Includes one year of CNS Affiliate membership in 2019 for ANSPA Members only

IMPORTANT DATES TO REMEMBER

- SEPTEMBER 6** Advance registration discount and housing deadline
- SEPTEMBER 13** Last day to cancel registration in order to receive a full refund, less a \$100 processing fee
- SEPTEMBER 25** Last day to make any hotel changes or cancellations through the CNS Housing provider:
Email: cns@mcievents.com
Phone: 800-931-9543
International: 972-349-5539
- SEPTEMBER 26** Any hotel changes or cancellations must be made directly with the hotel after September 25. 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 13, 2018. Course, seminar, and event tickets will be refunded in full until September 13, 2018. No refunds of any kind will be given after this date, regardless of cause. Refunds will not be given for no-shows. Any changes to existing badges after the published cut-off date of September 13, 2018, are assessed a \$50 processing fee.

CANCELLATION REQUESTS ACCEPTED VIA:

E-mail: cns@mcievents.com
Fax: 972.349.7715
Mail: CNS Annual Meeting
CNS Registration and Housing Center
6100 West Plano Parkway
Suite 3500
Plano, TX 75093

Contact the official CNS Annual Meeting Registration and 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/2018 to make your reservation today! Be sure to complete the entire housing section on the reservation form.

Hotel Reservation Information and Deadlines

Hotel reservations are only available to registered CNS attendees. See pages 79-81 for housing details. Rooms are subject to availability. Reserve your room by September 6, 2018.

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 for new reservations is September 25 based on availability. 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 25. Beginning September 26, changes and cancellations must be made directly with your reserved hotel. Please refer to your housing confirmation for your individual hotel's cancellation policy.

Beginning September 26, 2018

- › 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 and International Vista Resident Member Attendees

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

To be considered for this program, CNS Resident members and International Vista Resident members must:

- › Complete and submit the Resident member housing application by July 20, 2018. 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 2018 CNS Annual Meeting by July 20, 2018.
- › All residents enrolled in ACGME approved programs have been automatically given complimentary CNS Resident membership.
- › If you are not a CNS Resident member or International Vista Resident member, complete your application by May 31, 2018.

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/2018/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 (Deposit amount inclusive of local/state tax and fees*)
Marriott Marquis Houston – Headquarters Hotel (connected to GRB Convention Center)	\$269	\$314.73
Embassy Suites by Hilton Houston Downtown	\$239	\$279.63
Four Seasons Hotel Houston	\$305	\$359.10**
Hampton Inn Houston Downtown	\$239	\$279.63
Hilton Americas—Houston (connected to GRB Convention Center)	\$269	\$314.73
Homewood Suites by Hilton Houston Downtown	\$239	\$279.63
Westin Houston Downtown	\$219	\$256.23
* Tax rates subject to change. **An additional State Cost-Recovery Fee of \$2.25 will be charged per room per night. The fee will not be included in the one night room and tax deposit.		

CONTINUE YOUR CNS SIGNATURE EXPERIENCE AT OUR SELECT HOTELS.



Marriott Marquis Houston—Headquarters Hotel

1777 Walker Street
Houston, TX 77010

*Connected to George R. Brown Convention Center
Shuttle service only provided to and from dinner seminars and social events as applicable.*

Amenities Include:

- › 6 Restaurants Onsite
- › Full Service Spa
- › Valet Dry-Cleaning



Four Seasons Hotel Houston

1300 Lamar Street
Houston, TX 77010

5 blocks to George R. Brown Convention Center

Amenities Include:

- › 2 Restaurants Onsite
- › Full Service Spa
- › Car Rental
- › Laundry and Dry-Cleaning Services
- › Activities for Kids



Embassy Suites by Hilton Houston Downtown

1515 Dallas Street
Houston, TX 77010

3 blocks to George R. Brown Convention Center

Amenities Include:

- › Complimentary Cooked-to-Order Breakfast and Evening Cocktail Reception
- › Pets allowed
- › 1 Restaurant Onsite



Hampton Inn Houston Downtown and Homewood Suites by Hilton Houston Downtown

710 Crawford Street
Houston, TX 77002

4 blocks to George R. Brown Convention Center

Hampton Inn Houston Downtown Amenities Include:

- › Complimentary Hot Breakfast

Homewood Suites by Hilton Amenities Include:

- › Complimentary hot breakfast and Evening reception
- › Suites with fully equipped kitchen

Walk to the convention center on your own schedule when you stay at one of these conveniently located hotels. All hotels offer:

Complimentary In-room Wi-Fi
Complimentary Fitness center

In-room coffee/tea
Room service



CNS



Hilton Americas-Houston

1600 Lamar Street
Houston, TX 77010

Connected to George R. Brown Convention Center

Amenities Include:

- > 3 Restaurants Onsite
- > Full Service Spa



Westin Houston Downtown

1520 Texas Avenue
Houston, Texas 77002

5 blocks to George R. Brown Convention Center

Amenities Include:

- > 1 Restaurant Onsite

HOUSTON DOWNTOWN



HOTELS + DISTANCE TO GRB CONVENTION CENTER

1. Embassy Suites Hotel - 3 blocks
2. Four Seasons Hotel - 5 blocks
3. Hampton Inn - 4 blocks
4. Hilton Americas Houston - Connected
5. Homewood Suites - 4 blocks
6. Marriott Marquis - Connected
7. Westin Houston - 5 blocks

--- METRO RAIL

7D Surgical
 Abbott
 Ad-Tech Medical Instrument Corp.
 Aesculap
 Amedica Corporation
 American Association of Neurological Surgeons
 Apex Medical, Inc.
 Arbor Pharmaceuticals, LLC
 Arkis BioSciences
 Baylor Scott & White Health
 Best Medical International
 Boss Instruments Ltd.
 Boston Scientific
 Brain Aneurysm Foundation
 Canon
 CAE Healthcare
 Centinel Spine
 CMF Medicon Surgical Inc.
 CSL Behring
 CT Assist
 DePuy Synthes
 Designs For Vision, Inc.
 DIXI Medical USA
 DJO Global
 elliquence, LLC.
 Elsevier, Inc.
 Fehling Surgical Instruments, Inc.
 FUJIFILM VisualSonics, Inc
 Gauthier Biomedical Inc.
 Globus Medical
 Hayes Locums
 HCA
 Hitachi Aloka Medical America, Inc.
 Hydrocephalus Association
 HyperBranch Medical Technology Inc.
 IMRIS
 Innovasis, Inc.
 Integra
 Integrity Implants

Invenio Imaging Inc
 InVivo Therapeutics
 joimax, Inc. – Endoscopic Spine Surgery
 Journal of Neurosurgery
 JTS Surgical
 K2M, Inc.
 Karl Storz Endoscopy - America, Inc.
 Kelyniam Global, Inc.
 Kinamed, Inc.
 Kirwan Surgical Products
 KLS Martin
 Kogent Surgical
 Koros USA, Inc.
 Leica Microsystems
 Life Instrument Corporation
 Medical Education & Research Institute
 Medtronic, Inc.
 Misonix, Inc.
 Mizuho America, Inc.
 Mizuho OSI
 Monteris Medical
 MRI Interventions
 Nadia International, Inc.
 Natus Neurology Incorporated
 NeuroPace, Inc.
 NeuroPoint Alliance
 Nevro Corporation
 NICO Corporation
 North American Neuromodulation Society (NANS)
 North American Spine Society
 NovaBone Products
 NSK America Corp.
 NuTech Spine
 Orthofix
 OssDsign
 OsteoMed
 Oxford University Press
 Panasonic System Communications Co. of North America

Paradigm Spine, LLC
 Penumbra, Inc.
 Peter Lazic U.S. Inc.
 Pfizer, Inc.
 Philips EGI
 PMT Corporation
 pro med instruments, Inc.
 Raumedic, Inc.
 Renishaw, Inc.
 Rose Micro Solutions
 RosmanSearch
 RTI Surgical
 Samsung
 Scanlan International, Inc.
 Shukla Medical
 SI-BONE
 Sophysa
 Spinal Simplicity
 Spine Wave
 Spineology Inc.
 Stryker
 SurgiTel / General Scientific Corp
 Sutter Medical Technologies USA
 Synaptive Medical
 Takayama Instrument, Inc
 TeDan Surgical Innovations
 Thieme Medical Publishers
 ThinkFirst National Injury Prevention Foundation
 Thompson Surgical Instruments, Inc.
 Wolters Kluwer Health
 Xoran Technologies LLC
 Zimmer Biomet





2018 tumor section satellite symposium

cns tumors: Innovative Technology
that Advances Patient Care

HOUSTON, TEXAS • OCTOBER 5-6, 2018



New technological advances in CNS tumor care are impacting the care of tumor patients in the operating room and beyond. At this two-day symposium, learn how immune-based therapies for CNS tumors, big data, and artificial intelligence are improving patient care.

- General Scientific Sessions
- Original Science Sessions
- Breakfast Symposia
- Industry-sponsored Luncheons
- Gala Reception and Dinner
- Sawaya Symposium
- Exhibit Hall and more!

REGISTER AT CNS.ORG/TUMOR

The Tumor Section Satellite Symposium immediately precedes the 2018 CNS Annual Meeting.

*Registrants receive a promo code for \$100 off the 2018 CNS Annual Meeting registration fee!



CNS

Thank You

The Congress of Neurological Surgeons gratefully acknowledges our Industry Allies Council Partners for their continued support.

AMBASSADOR

Medtronic

stryker[®]

PREMIER PARTNER

Canon

DePuy Synthes
COMPANIES OF *Johnson & Johnson*

synaptive 

INTEGRA
LIMIT UNCERTAINTY 

OLYMPUS[®]
Your Vision, Our Future

ZEISS

INDUSTRY ALLIES COUNCIL

arbor[™]
PHARMACEUTICALS, L.L.C.

 **MicroVention**[®]
TERUMO

Penumbra 

 **ZIMMER BIOMET**

KLS martin[®]
GROUP

SUPPORTER

 **Abbott**

 **MIZUHO**
Medical Innovation

STORZ
KARL STORZ ENDOSCOPY

Thompson 
SURGICAL INSTRUMENTS


MONTERIS[®]
MEDICAL


LEGALLY MINE

 **PARADIGM SPINE**
the movement in spine care